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# skin diver

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# U.S. NAVY DEEP DIVE



DEPARTMENT OF THE NAVY  
NAVY EXPERIMENTAL DIVING UNIT  
PANAMA CITY, FLORIDA 32407

IN REPLY REFER TO:  
NEDU:JRM:pcs  
3000  
Ser

Mr. Dick Bonin, President  
Mr. Dennis Hart, Director of Engineering  
Scubapro USA  
3105 E. Harcourt  
Compton, California 90221

Dear Mr. Bonin and Mr. Hart,

In 1979 the Navy Experimental Diving Unit (NEDU) successfully conducted a world record dive to 1800 FSW in the Navy's Ocean Simulation Facility (OSF). At a depth of 1800 FSW, in-water physiological experiments conducted using a Low Resistance Breathing System (LRBS) designed specifically for this purpose.

The safety diver, who monitored the condition of the LRBS test used a Scubapro Pilot second stage regulator connected to a 30 foot umbilical. The Pilot regulator was found to adequately support a diver at this world record depth.

Consequently, NEDU would like to present to Scubapro USA the Pilot regulator (enclosed) used during "DEEP DIVE '79." Although second stage is no longer manufactured, the technology it represents credit to the engineering staff at Scubapro and is indicative of progress required to continually improve the quality of equipment the U.S. Navy as well as the sport diving community at large.

Sincerely,

*R.A. Bornholdt*  
R. A. BORNHOLDT  
Commander, U. S. Navy  
Commanding Officer

Enclosure as stated

"In recognition of... the technology it represents... a credit to the engineering staff at Scubapro... indicative of the progress required to continually improve the quality of equipment used by the U.S. Navy as well as the sport diving community at large."

**R.A. Bornholdt**  
Commander, U.S. Navy  
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MARCH 1981

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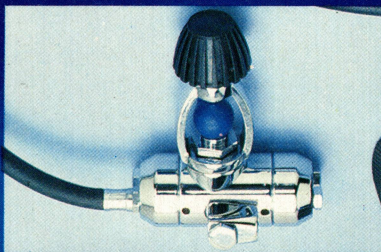
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# skin diver

Volume Thirty-One Number Seven

READER PREMIUM	8	<b>JEPPSEN SANDERSON AIR CONSUMPTION TABLES</b> BONNIE J. CARDONE	
		How long will your air last?	
ADVENTURE	19	<b>DIARY OF A COMMERCIAL DIVER</b> STEVEN M. BARSKY	
		Sometimes reality is better than fantasy	
LOCAL DIVING	33	<b>AUSTRALIA TRAVEL GUIDE</b> GERI MURPHY	
		Visit a diver's wonderland	
	103	<b>NASSAU</b> RICK FREHSEE	
		Something for everyone	
PHOTO TECHNIQUES	72	<b>FUJICHROME 100</b> JIM AND CATHY CHURCH	
		A good all around color film	
MISCELLANEOUS	32	<b>BAUER AIR COMPRESSORS</b> BILL GLEASON	
		Quality control and full service	
	83	<b>SPEARFISHING</b> DR. HEYWARD MATHEWS	
		A scientist's opinion	
DIVE BOATS	84	<b>THE METZELER ELEFANT</b> ERIC HANAUER	
	90	<b>THE SUPER DOLPHIN</b> STEVE LUCAS	
DIVE EQUIPMENT	86	<b>SEAPRO'S ZEPHER</b> GEORGE COZENS	
	88	<b>DUI'S ARGONAUT</b> BONNIE J. CARDONE	
	94	<b>SEAPRO'S SEACOMP CONSOLE</b> GERI MURPHY	
	95	<b>THE GUNSLINGER SPEARGUN</b> HOWARD HALL	
	96	<b>SCUBAPRO'S LIGHTNING JET FINS</b> BONNIE J. CARDONE	
	100	<b>FRANZUS ELECTRICAL CONVERTERS</b> GERI MURPHY	
TREASURE EQUIPMENT	92	<b>TREASURE EMPORIUM'S BACKPACKER</b> JIM WALKER	
LOCAL DIVING	110	<b>SHIPWRECKS OF CAPE ANN</b> PAUL H. SHERMAN	
		New England hot spot	
DEPARTMENTS	6	<b>DIVER'S CALENDAR</b>	14 <b>NEW BOOKS</b>
	11	<b>NEW GEAR</b>	26 <b>TECHNIFACTS</b>
			81 <b>SCUBA QUIZ</b>
			98 <b>Rx FOR DIVERS</b>
			128 <b>DIVER'S DIRECTORY</b>

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## COVER

David Loughnan jumps off the dive boat Auriga Bay into the warm water of the Great Barrier Reef. Australian diving includes the Barrier Reef and Coral Sea, and dive boats reach these sites from the Queensland Coast. For more information see Australian Guide on page 33. Photo/Geri Murphy.



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# SDM Editorial

## BY THE PUBLISHER

### BUDDY BREATHING OUT/ OCTOPUS IN

**A** scuba instructor was recently heard to say, "Buddy breathing will be outlawed within the next few years!" Although the statement may appear a little harsh, it does underscore the present current of discontent with this technique.

Today's active instructors seem to be caught in the grip of a controversy over the true value of buddy breathing as a realistic technique for underwater rescue. The traditionalists tend to stick by the old method, claiming more emphasis should be placed on buddy breathing practice, while the progressives want to discard this technique in favor of pushing the octopus concept.

The trend is most definitely toward the octopus regulator and buddy breathing may very well be obsolete soon. Every major regulator manufacturer in the U.S. now manufactures, advertises, and promotes an octopus model. Practically every resort underwater guide and every instructor conducting open water training sessions now wears an octopus rig as a regular part of his/her scuba dress. And, octopus usage has become a standard in most all advanced diver training programs.

What's wrong with buddy breathing? It has been an accepted method of diver rescue for about 30 years, so why is it suddenly undesirable?

No one will argue the fact that buddy breathing has saved many, many lives over the past three decades. These rescues have been clearly documented. The question which haunts every instructor is how many lives have been lost in attempted buddy breathing situations? Clues to this problem have only come to light in recent years of accident investigation. If a life is lost for every life saved, then we must find a better way!

In the beginning, when every diver was wearing a double hose regulator, buddy breathing was the only practical method for buddy assist. The method had valid application, and was therefore adopted by every instructor and written

into every scuba training manual.

Times have changed. The old fashion double hose regulator has virtually disappeared from the American sport diving market. Single hose regulators are the accepted standard for both scuba classes and equipment rentals. Unfortunately, the buddy breathing method still lingers: Not because it is the best method for diver rescue but because it is still listed in every scuba training manual and textbook on the market today.

Buddy breathing is a fairly simple skill which can be taught to any scuba student during pool training sessions. A demonstration by the instructor and a few practice attempts, and most every student has the technique mastered — or at least thinks he/she has. The one big flaw in this seemingly simple theory is that buddy breathing requires practice, practice, and more practice. Every time a diver changes buddies or starts a day of diving, buddy breathing should be practiced. Unfortunately, few do.

Human nature being what it is, people tend to ignore, forget, or procrastinate. A Florida study of a group of training and certified scuba divers revealed that less than 25 percent had done any buddy breathing practice one year after the completion of their training course. Of those divers who had not practiced, less than 5 percent were able to successfully complete a buddy breathing test in a swimming pool! Without constant practice, the theory of buddy breathing as a practical method of diver rescue becomes totally invalid.


In addition to the problem of practice, there are now a growing number of underwater circumstances where the buddy breathing method is extremely difficult, if not impossible, even for skilled instructors. Strong currents or heavy surge often prevent buddy breathing partners from maintaining the critically close body position necessary for performing the skill. The darkness of caves, shipwrecks, and night diving

can seriously compound the problems of swapping the mouthpiece. Regulator sharing is equally difficult in zero visibility or turbid waters.

Most serious of all are the problems related to the early stages of panic. A diver out of air is a person struggling to save his/her life. If he or she hasn't had a breath of air for more than one minute (60 seconds goes by fast), reason and past training are often replaced by a mounting wave of fear. Under these conditions, attempts at buddy breathing often turn into tragic cases of trembling hands, fumbling fingers and total failure. More than one diver has generously offered his mouthpiece to a breathless diver — and never got it back! The accident report files are filled with horror stories of double-deaths, and there is now evidence that buddy breathing failure is implicated in 20 to 25 scuba accidents every year.

The octopus regulator is here — you can buy one over the counter at any pro dive shop. What's more, the octopus design is being steadily improved. Longer hose lengths permit greater mobility and ease for the buddy being assisted. A left-handed octopus has been designed by one manufacturer. Many octopus units are brightly colored for easier, quicker identification. There's no reason on earth why every diver shouldn't own, and wear, an octopus rig. The life you save could be your buddy's, your own, or both.

Sport divers in the U.S. are using more sophisticated equipment than ever before. We offer more training and better training than ever before. We engage in more diving and more serious diving than ever before. And, we conduct more research into diver accidents, resulting in greater revelations about the problems of safety.

With this kind of knowledge and technology at our fingertips, isn't it time we considered replacing buddy breathing with octopus assist as the primary method for diver rescue? 



# Commercial Diving Is Serious Business



The demand for natural resources from the sea has never been greater. Twenty years ago, there were only a handful of offshore drilling rigs located in coastal and gulf waters. Today, there are thousands of deep-water platforms throughout the world. The need for qualified personnel to man and operate these facilities is ongoing. Your entry into the world of deep-sea diving will be a most prestigious and rewarding career. *Not only is there a demand for divers in the oil industry, but underwater construction, salvage, farming and environmental awareness need trained technicians also.* Your first step to employment as a commercial diver is training.

Divers Institute of Technology (DIT) was founded by men who have successfully met the challenges of inner-space. They know from experience what it takes to get the job done. Retired Navy and professional deep-sea divers joined forces over 13 years ago to establish a commercial diving school that would train and graduate only qualified entrants to the industry. The success of the DIT program can be measured by our physical growth, the credentials we have attained, and not only the number of top workers we have supplied to major commercial diving firms throughout the world in the oil industry, but to companies in

salvage and repair, inspection, underwater farming, etc. *We do not specialize only in the oil industry as some schools do.*

Divers Institute of Technology developed a six-month course that set an industry standard. Training is based on a highly sophisticated deep-sea diving program that prepares you both mentally and physically to enter this new environment. Our curriculum has been designed to prepare you for gainful employment in *all fields of commercial diving, not only in the oil industry.* Classroom instruction deals in facts and theory. Open water instruction gives you the practical application of classroom techniques. *The culmination of your training is actual dives to depths of 200 feet. To our knowledge, we are the only commercial school that puts you to this test. The confidence gained from this experience is unequaled.* Before you decide which school to attend, check this point out. Many schools provide only simulated deep dives in recompression chambers and diving tanks on dry land.

After proper training and graduation, you are prepared to enter the commercial diving field. It is then that you will realize a great deal of responsibility comes with the territory. Responsibility to perform the tasks you were trained to do! Responsibility to your diving team and responsibility to all support personnel. *DIT will not graduate a student unless confident he possesses the ability to become a qualified commercial diver.*

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## Diver's Calendar

**July 9-Sept. 26** Los Angeles County U/W Instructors' Association advanced diving program. Eighteen lecture and open water sessions. (Contact: Ben Cariga at (213) 327-5311)

**July 10-11** YMCA Scuba Lifesaving and Accident Management course with specialty certification for divers and SLAM instructor certification for YMCA instructors. (Contact: Ken McCracken, Land/Sea Passages, 14 E. Water St., Harrisonburg, VA 22801; (703) 433-2177)

**July 10-11** California Beach Dive Photo Competition. Photos to be taken on July 10. Forty-five awards plus door prizes. (Contact: Alameda Divers, c/o Divers Exchange, 649 Pacific Ave., Alameda, CA 94501)

**July 17-18** YMCA Assistant Instructor Institute. Instruction and testing on scuba skills, knowledge and teaching techniques. (Contact: Ken McCracken, Land/Sea Passages, 14 E. Water St., Harrisonburg, VA 22801)

**July 17-24** Diving and the Meditative Experience. Sponsored by PRIDE, foundation for the Protection of Reefs and Islands, at Meridian Club, Turks and Caicos Islands. Exploring diving as a meditative state. (Contact: Drs. Randolph and Kent, 6690 SW. Ventura Dr., Portland, OR 97223; (506) 245-8004)

**July 24-25, 31-Aug. 1, Aug. 7-8** YMCA Instructor Institute. SLAM and assistant instructor certifications are pre-requisites. (Contact: Ken McCracken, Land/Sea Passages, 14 E. Water St., Harrisonburg, VA 22801)

**August 1** Long Island Diver's Association Second Annual Expedition Aquawoman aboard the *Wahoo* at Captree Boat Basin. (Contact: Edith Hoffman at (516) 643-9163)

**August 14-15** Fourth Annual Pacific Coast Underwater Photographic Championships, San Diego, CA. Sponsored by the San Diego Council of Divers, Farallon/Oceanic, Aqua-Craft, Kodak, Scubapro, and Photoc of San Diego. (Contact: PCUPC, Al Bruton, 4517 Maryland St., San Diego, CA 92116)

**September 11** Fifth Annual Divers' Day at Marine World, Redwood City, CA. Presented by the Central California Council of Diving Clubs and Marine World-Africa USA. Program includes scuba skills demonstrations, manufacturer display booths, wacky water races, safety demonstrations. (Contact: Cen-Cal, P.O. Box 779, Daly City, CA 94017)

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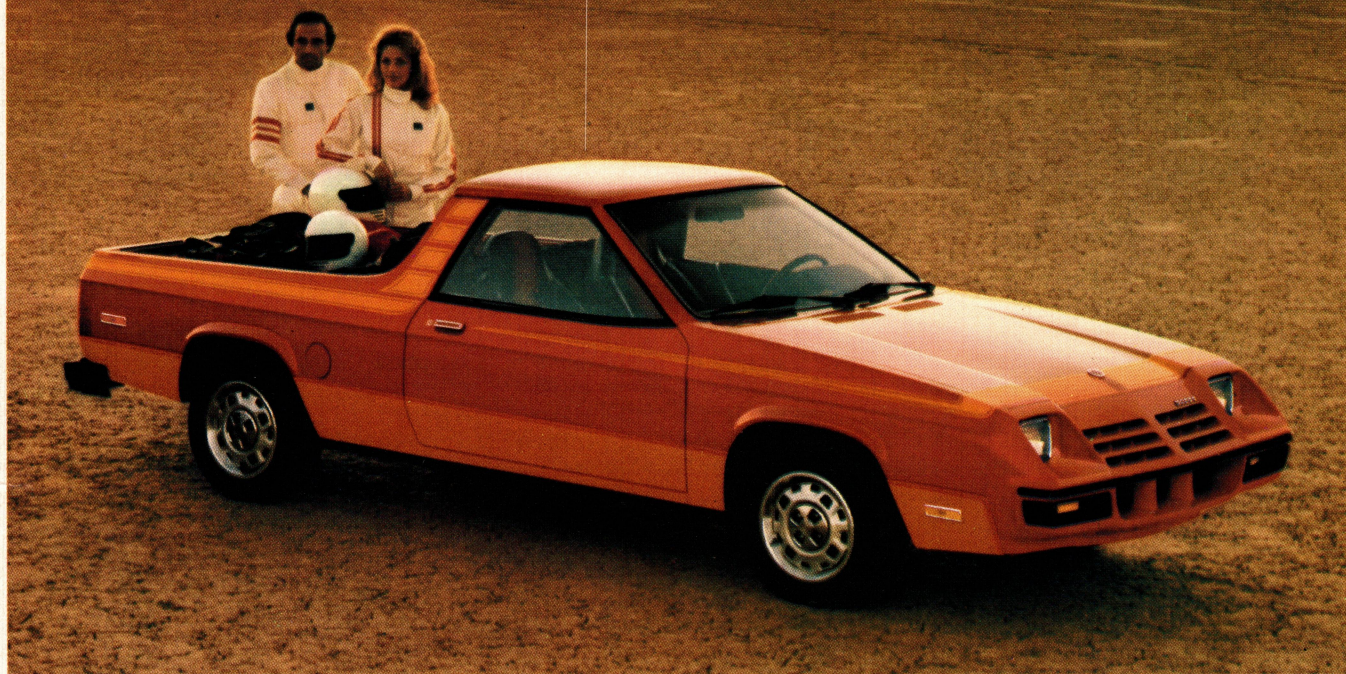
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# RAM TOUGH



**A**ir consumption underwater is highly individual. It is influenced not only by the size, physical condition and experience of the diver but also by environmental factors such as water temperature and depth. Smaller divers with smaller lung capacities should use less air. However, in 60°F water a 5'2" novice woman diver who chills easily will probably empty her scuba tank quicker than a 6'2" man who never gets cold and has been diving for several years.

Air consumption tables are not a substitute for a submersible pressure gauge and there should never be a time when they are used instead of one. There may be times, however, when you would like to know approximately how long you would be able to stay underwater at a certain depth with a limited air supply. For example, if you must make an emergency dive and have only one tank of air, it would be important to know if you could reach the desired depth and return safely. Air consumption tables and knowledge of your own breathing rate would tell you if such a thing is possible.

No matter what your reason for wanting to know your air consumption, we present here a table on which it has already been computed for various depths. First, however, you will need to determine your air consumption on the surface or at a certain depth. Once you know this, you will be able to use the table.

Once upon a time, in scuba class, you learned about Boyle's Law. Put into my own words, this simply says that the volume of a gas decreases when pressure on it increases. In this case the gas is the air a diver breathes from a regulator and the pressure is that to which both diver and air are subjected by water. The deeper a diver goes, the more pressure there is on him and his air supply. At 33 feet there is twice as much pressure as

there was on the surface; at 66 feet, triple the pressure; and at 99 feet, quadruple the pressure. That means that at 33 feet it takes twice as much air to fill a diver's lungs as it did on the surface; at 66 feet, three times as much air; and at 99 feet, four times as much air. The point is, the deeper a diver goes, the more air he/she will consume with each breath.

To determine your own air consumption, you will need to make a timed swim at one particular depth, reading your pressure gauge at the beginning and the end. This will give you an idea of the air you use and you can then apply this knowledge to use the table. A timed swim on the surface is the easiest, but a timed swim at depth will probably result in a more realistic air consumption rate. Unless you swim at a depth shown on the table, you will need to do some calculations.

Let's work through an example: You swim across a sandy bottom at 30 feet for 10 minutes. Your pressure gauge reads 2350 when you start and 2050 when you finish. What would your air consumption be, in psi per minute, at the surface? Subtracting 2050 from 2350 gives you the total psi breathed in 10 minutes — 300. Dividing 300 by 10 gives you 30 — your air consumption rate at 30 feet. You can apply this number directly to the Air Consumption Table, but use the following formula to determine your breathing rate at the surface. Then, no matter the depth at which you make your timed swim, you will be able to determine your air consumption rate.

$$\frac{\text{psi} \div \text{time}}{33} = \text{psi per minute (surface)}$$

$$\frac{33^* + \text{depth}}{33}$$

\* 33 = 1 Atmosphere — the fraction just 33 makes it easier to use in this equation. Substituting our data and working through the problem, it looks like this:

$$\frac{300 (\text{psi}) \div 10 (\text{time})}{\frac{33}{33}} = \frac{30}{33} = \frac{30}{1.9} = 15.7$$

Thus, you would consume 15.7 psi per minute at the surface.

Now, you are ready to use the Air Consumption Table. This is found in the Appendix of the Jeppesen Sanderson *Sport Diver Manual, Volume II*. Across the top are depths in feet, ranging from 10 to 160. On the left side of the table are air consumption rates at the surface, in psi per minute. Find the number on the left that approximates the breathing rate (15.7) you just determined. In this case, 16 is the closest. Reading across you can now see approximately how many psi you will breathe at any depth from 10 to 160 feet. Dividing your beginning tank pressure by these numbers will tell you approximately how many minutes you have at each depth.

After you calculate it, you may want to underline your air consumption rate or draw a line through it with a yellow marking pen. If you laminate it, you can carry it in your gear bag. Be sure to note somewhere on it what kind of tank you used and its working pressure (the psi to which it can be filled). Remember, this air consumption rate is only valid if you are breathing from the same kind of tank you used to calculate your air consumption. If you use different tanks (i.e., go from a steel 72 to an aluminum 80, doubles instead of a single, etc.) you will have to recalculate this rate. Also remember that air consumption varies from day-to-day and dive-to-dive. Any of these calculations are only estimates.

Information on Jeppesen Sanderson materials for dive stores and instructors is available from: Marketing Manager, Sport Diver Products, Jeppesen Sanderson, 55 Inverness Drive East, Englewood, CO 80112.

#### ESTIMATING AIR CONSUMPTION AT DEPTH

1. Make a timed swim at one particular depth, reading your SPG at the beginning and end of swim.
2. Subtract ending psi from beginning psi to determine psi used during swim.
3. Using the following formula, estimate your air consumption rate on the surface:

$$\frac{\text{psi} \div \text{time}}{33} = \text{psi per minute (surface)}$$

$$\frac{33 + \text{depth}}{33}$$

4. Find the psi per minute on the surface on the left side of the Air Consumption Table that is closest to your estimated psi per minute. Read right until you come to the desired depth.
5. To estimate how many minutes your tank of air will last at that depth, divide number of psi in tank (per SPG reading) by psi per minute used at that depth.

# You Can Predetermine How Much Air You'll Need For A Specific Dive

# AIR CONSUMPTION TABLES

By Bonnie J. Cardone



# AIR CONSUMPTION TABLE AT DEPTH

DEPTH IN FEET

Surface	10	15	20	25	30	40	50	60	70	80	90	100	120	140	160
15	19.5	21.8	24.0	27.0	28.5	33.0	37.5	42.0	46.5	51.0	55.5	60.0	69.0	78.0	87.0
16	20.8	23.2	25.6	28.8	30.4	35.2	40.0	44.8	49.6	54.4	59.2	64.0	73.6	83.2	92.8
17	22.1	24.7	27.2	30.6	32.3	37.4	42.5	47.6	52.7	57.8	62.9	68.0	78.2	88.	98.6
18	23.4	26.1	28.8	32.4	34.2	39.6	45.0	50.4	55.8	61.2	66.6	72.0	82.8	93.6	104.4
19	24.7	27.6	30.4	34.2	36.1	41.8	47.5	53.2	58.9	64.6	70.3	76.0	87.4	98.8	110.2
20	26.0	29.0	32.0	36.0	38.0	44.0	50.0	56.0	62.0	68.0	74.0	80.0	92.0	104.0	116.0
21	27.3	30.5	33.6	37.8	39.9	46.2	52.5	58.8	65.1	71.4	77.7	84.0	96.6	109.2	121.8
22	28.6	31.9	35.2	39.6	41.8	48.4	55.0	61.6	68.2	74.8	81.4	88.0	101.2	114.4	127.6
23	29.9	33.4	36.8	41.4	43.7	50.6	57.5	64.4	71.3	78.2	85.1	92.0	105.8	119.6	133.4
24	31.2	34.8	38.4	43.2	45.6	52.8	60.0	67.2	74.4	81.6	88.8	96.0	110.4	124.8	139.2
25	32.5	36.3	40.0	45.0	47.5	55.0	62.5	70.0	77.5	85.0	92.5	100.0	115.0	130.0	145.0
26	33.8	37.7	41.6	46.8	49.4	57.2	65.0	72.8	80.6	88.4	96.2	104.0	119.6	135.2	150.8
27	35.1	39.2	43.2	48.6	51.3	59.4	67.5	75.6	83.7	91.8	99.9	108.0	124.2	140.4	156.6
28	36.4	40.6	44.8	50.4	53.2	61.6	70.0	78.4	86.8	95.2	103.6	112.0	128.8	145.6	162.4
29	37.7	42.1	46.4	52.2	55.1	63.8	72.5	81.2	89.9	98.6	107.3	116.0	133.4	150.8	168.2
30	39.0	43.5	48.0	54.0	57.0	66.0	75.0	84.0	93.0	102.0	111.0	120.0	138.0	156.0	174.0
31	40.3	45.0	49.6	55.8	58.9	68.2	77.5	86.8	96.1	105.4	114.7	124.0	142.6	161.2	179.8
32	41.6	46.4	51.2	57.6	60.8	70.4	80.0	89.6	99.2	108.8	118.4	128.0	147.2	166.4	185.6
33	42.9	47.9	52.8	59.4	62.7	72.6	82.5	92.4	102.3	112.2	122.1	132.0	151.8	171.6	191.4
34	44.2	49.3	54.4	61.2	64.6	74.8	85.0	95.2	105.4	115.6	125.8	136.0	156.4	176.8	197.2
35	45.5	50.8	56.0	63.0	66.5	77.0	87.5	98.0	108.5	119.0	129.5	140.0	161.0	182.0	203.0
36	46.8	52.2	57.6	64.8	68.4	79.2	90.0	100.8	111.6	122.4	133.2	144.0	165.6	187.2	208.8
37	48.1	53.7	59.2	66.6	70.3	81.4	92.5	103.6	114.7	125.8	136.9	148.0	170.2	192.4	214.6
38	49.4	55.1	60.8	68.4	72.2	83.6	95.0	106.4	117.8	129.2	140.6	152.0	174.8	197.6	220.4
39	50.7	56.6	62.4	70.2	74.1	85.8	97.5	109.2	120.9	132.6	144.3	156.0	179.4	202.8	226.2
40	52.0	58.0	64.0	72.0	76.0	88.0	100.0	112.0	124.0	136.0	148.0	160.0	184.0	208.0	232.0

CONSUMPTION RATE AT SURFACE (PSI PER MINUTE)



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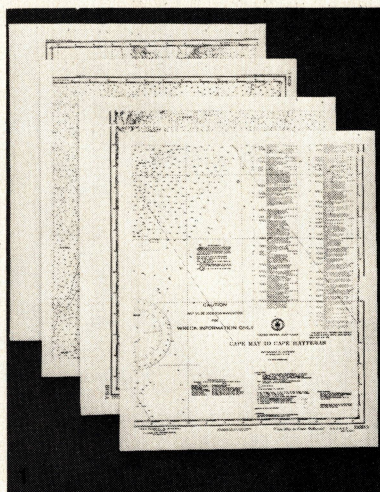
ALASKA: Alaska Mining & Diving Supply, Anchorage; R & R Diving, Valdez. CALIFORNIA: Dolphin Scuba Diving Ctr, Sacramento. COLORADO: Seatrek, Englewood. CONNECTICUT: All-Gas, Hartford; Central Sales, Thomaston; Jack's Dive Shop, Plainville; Orbit Marine, Bridgeport. DISTRICT OF COLUMBIA: National Diving. DELAWARE: First State Sports, New Castle. FLORIDA: Diver Dan's Skin & Scuba, Casselberry; Diving Site, Marathon Shores; Matheney's Aquatics Unlimited, Orange Park; Tackle Shack, Pinellas Park; Underseas, Inc., Big Pine Key. GEORGIA: Adventure Bound, Savannah. ILLINOIS: Berry Scuba, Chicago. INDIANA: Ouabache Outfitters, Terre Haute. KENTUCKY: Pikeville Dive Shop, Pikeville. MAINE: Aqua Diving Academy, Portland; Northeast Divers, Brewer. MARYLAND: Bay Country Boats, Deale; Calypso Dive Shop, Grasonville; Catalina, Inc., Lexington Park; Diver's Den, Baltimore; Diver's World, Silver Springs; Dynamo, Inc., College Park; Mike Parks Diving Supply, Baltimore; Scuba Shoppe, Rockville; Sea Colony Dive Shop, Riviera Beach. MASSACHUSETTS: Al's Rod & Gun Shop, Lawrence; Diver's Den, Attleboro; East Coast Divers, Brookline; Framingham & Hyannis; Holyoke Underwater Supply, Holyoke; Ship-Mate Dive Shop, E. Dennis; Westfield Water Sports, Westfield. MICHIGAN: Bruno's Dive Shop, Mt. Clemens. MINNESOTA: Central Minnesota Divers, St. Cloud; Kirckof & Assoc., Owatonna; Mick's Scuba, Moorhead. MISSOURI: Aquasports, Inc., Springfield. NEW HAMPSHIRE: Underwater Sports, Keene. NEW JERSEY: Dive Shop of New Jersey, Hurffville, Maple Shade & Ocean City; Diver's Supply, Cedar Grove; East Coast Diving, Northfield; Lakeland Divers, E. Hanover; M & E Marine Supply, Camden; Shark River Dive Center, Avon-By-The-Sea; Triton Divers, Brant Beach; Underwater Discovery, Toms River. NEW MEXICO: Randy's Scuba, Clovis. NEW YORK: Danny's Dive Shop, Baldwin; Island Scuba Center, Freeport; Marsh Scuba Supply, Poughkeepsie; Mt. Sheepshhead Ski & Scuba, Brooklyn; Nypenn Divers, Binghamton; Pisces School of Dive, E. Rochester; Regional Divers, Wallkill; Scuba Training & Equip., West Nyack; Suffolk Diving Center, E. Northport; Wind Riders, Livonia. OHIO: Aqua Specialists, Cleveland. OREGON: Deep Sea John's, Newport; Quiet World, Charleston. PENNSYLVANIA: Aqua Hut Plus, Philadelphia; Diving Bell, Philadelphia; Harrisburg Scuba Center, Harrisburg; Jolly Roger, Richland; Scuba Tank, Bethlehem; Sea World Divers, Allentown; Weber's Dive Shop, Baden. RHODE ISLAND: Divers World, E. Greenwich; Shelter Cove Diving, Charleston. VIRGINIA: Dive Shop, Falls Church; Scuba Ventures, Virginia Beach; Ski & Dive Shop, Alexandria; W & W Dive Shop, Richmond. WEST VIRGINIA: Reef Raiders Dive Shop, South Charleston. WISCONSIN: Deep End Scuba Center, Fond du Lac.

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- JULY 9-18**, San Diego, Calif. - Mark Flahan, Center for Marine Studies, SDSU, San Diego, CA 92182; (714) 265-6523
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- JULY 10-18**, Buffalo, N.Y. - Dallas Edmiston, 39 Garfield St., Lancaster, N.Y. 14086; (717) 681-2932
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- AUG. 14-22**, North Atlantic - Providence, R.I., Eric Dewhirst, 61 N. Spruce St., East Providence, R.I. 02914
- AUG. 20-29**, Southwest - Houston, Texas, 22nd Anniversary ITC, Steve Golden or Larry Cushman, 5705 Glenmont, Houston, TX 77081; (713) 661-6080
- SEPT. 1-OCT. 2**, West Pacific - Honolulu, Hawaii, weekends, Brad Revis, 98-025 Hekaha St., Aiea, HI 96701; (808) 487-9060
- SEPT.-OCT.**, North Atlantic - Keene, New Hampshire, Dave Werner, 140 Fairgrounds Heights, Springfield, VT 05156
- SEPT. 3-11**, South Atlantic - Melbourne, Florida, Bob Rutledge, 7705 SW 71 Ave., Miami, FL 33143
- \* **SEPT. 11-18**, Professional Development Center
- \*\* **SEPT. 16-23**, Professional Development Center
- OCT. 2-31**, Bojac Swim and Scuba School, Hawaii - 2 week day evenings for 4 weeks plus 4 weekends, Bob Hoffman, c/o Bojac, 94-366 Pupupu St. Waipahu, HI 96797; (808) 671-0311
- OCT. 2-9**, Mid America - Orongo, Missouri, Mark Novak, 4817 W. Farmington, Peoria, IL 61604; (309) 674-3880
- \* **OCT. 9-16**, Professional Development Center
- OCT. 9-16**, North Atlantic - Burlington, Vermont, Art Cohn, Northern Divers, 100 Main St., Burlington, VT 05401
- \*\* **OCT. 10-17**, Professional Development Center
- OCT. 10-18**, Australasian Chapter - Tangalooma Resort, Moreton Island, Queensland (Australia), Phil Feldman, Course Director, NAUI Australasian Chapter, P.O. Box 68, Capalaba, Qld 4157; (07) 390-3113
- OCT. 24-31**, North Atlantic - Framingham, Mass., John LeClair, East Coast Divers, 280 Worcester Rd., Framingham, MA 01701
- \* **NOV. 13-20**, Professional Development Center
- \* **DEC. 4-12**, Professional Development Center

- \* 9547 Valley View, Cypress, CA 90630; (714) 761-6348
- \*\* (Hall's Diving Center), 1688 Overseas Highway, Marathon, FL Keys 33050; (305) 743-5929

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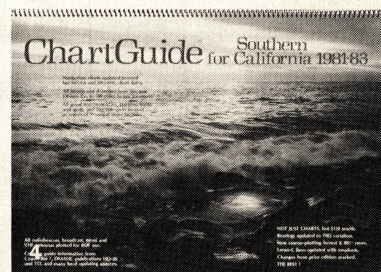


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(Continued on Page 16)



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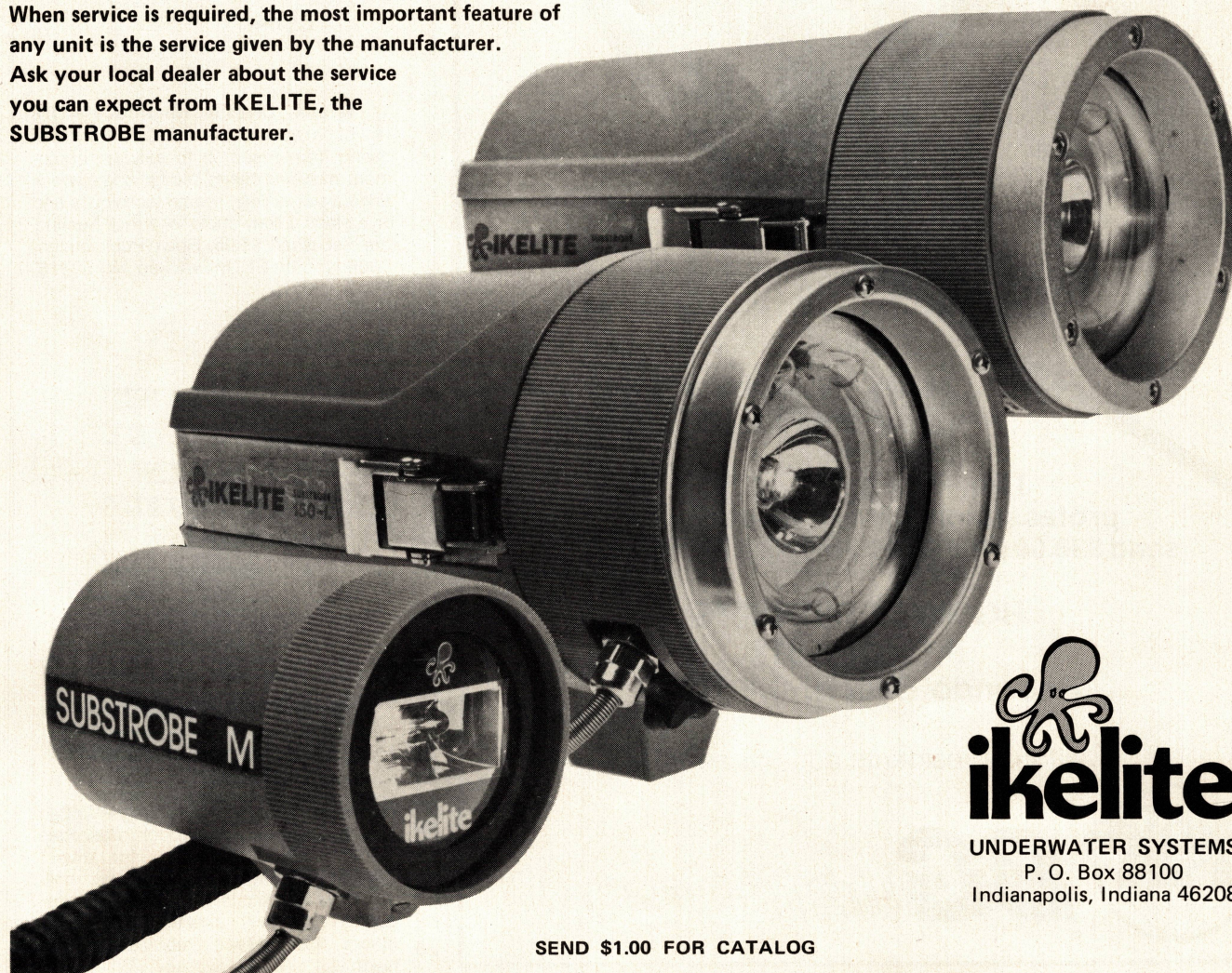
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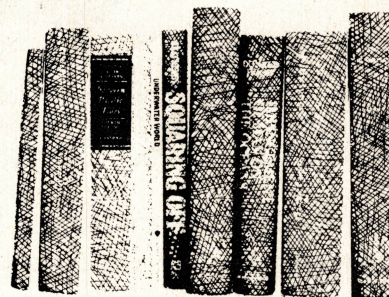
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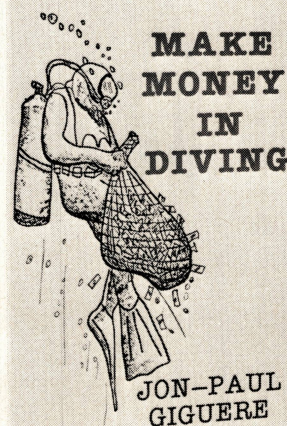


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Kimm A. StabelFeldt

**1 Wreck Diver's Handbook**—This book covers the subjects of wreck diving from research to salvage equipment, including charts, recognizing a wreck underwater, safety, search techniques and dive plans. Likely spots for wreck hunting are discussed. \$5.95. Rowe Publications, 3906 N. 69th St., Milwaukee, WI 53216.

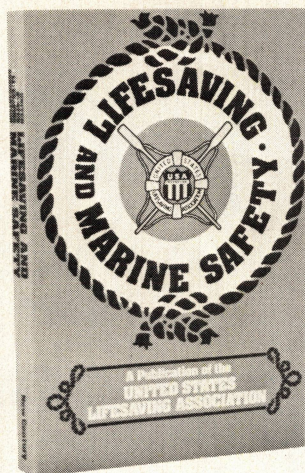


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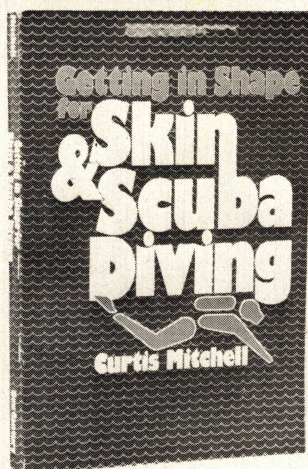
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**2 Make Money in Diving**—Written diver-to-diver, this book describes money making activities for divers including writing, relic recovery, golf-ball hawking, scuba instruction, salvage, gold diving, hull cleaning and many others. \$3.95. Rowe Publications, 3906 North 69th St., Milwaukee, WI 53216.





- 3 Lifesaving and Marine Safety**—A publication of the U.S. Lifesaving Association, this book thoroughly covers all aspects of the subject from public relations to knot tying. Includes information on surf conditions, equipment, procedures and communication. \$14.95. New Century Publishers, Piscataway, NJ.



- 4 Getting in Shape for Skin and Scuba Diving**—Exploring such areas as conditioning, dive physiology, dive maladies and swimming skills; this book is designed to show the diver how to analyze his/her compatibility with diving and how to improve it. \$6.95. New Century Publishers, Piscataway, NJ.



- 5 Shipwrecks of Truk**—Written and captioned in both English and Japanese, this work contains a brief history of the WW II engagements which resulted in the host of sunken wrecks on Truk. Sixty gorgeous color plates of the sunken ships. \$14.95. Philip Rosenberry, Box 1351, Kealahou, HI 96750.



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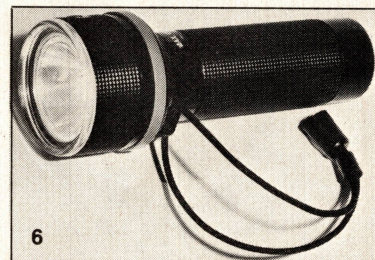
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### NEW GEAR

(Continued from Page 12)



**6 Dive Lights**—The Scubalight is O-ring sealed and watertight to 200 feet. Operates up to 13 hours with a fresh set of disposable batteries. Its larger brother, the Minilight, will operate on either four or eight AA cells. Both lights have magnetic reed switches. \$26.00 and \$34.00, respectively. From Scubapro.

**7 Dive Mask**—With low volume (allowing exceptional vision and easy clearing) and a soft hypoallergenic silicone skirt, this mask comfortably fits a wide range of faces. Skirt comes in clear or black and frames come in blue or black. Nose pocket is easily reached by gloved hands. \$29. SeaQuest/Mares.

**8 BC Jacket**—The SeaJacket IV has a differential cut which form fits around the shoulders, preventing uncomfortable squeeze. Body Band secures the jacket without the need for shoulder or crotch straps. \$362.50 with backpack. Optional CO<sub>2</sub> and octopus pocket are extra. From SeaQuest, Solana Beach, CA.

(Continued on Page 66)



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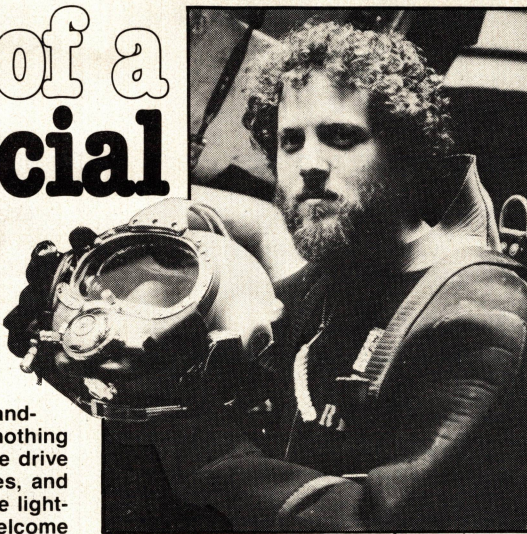




# Diary of a Commercial Diver

BY STEVEN M. BARSKY

**“I am nine years old and going to spend the summer with my grandparents at the beach. To me, there is nothing better. I roll my window down as we drive through the first of the salt marshes, and smell the sea air. There is the phone lighthouse and the sign which says, ‘Welcome to Atlantic City.’” ... New Jersey, 1961.**



photo/P. Cetti

Those were great summers. I can remember endless walks down the wooden boardwalk which ran parallel to the sea. In the morning, you could bicycle the length of the wooden structure, as long as you were off by the time the summer masses began their daily promenade. In the evenings, old men pushed enormous wicker chairs on castors, called roller chairs, from one end of the boardwalk to the other. For a few dollars an hour, romantic young couples, or even families, would ride in those

chairs, covered in heavy blankets against the cool evening breeze.

Saltwater taffy was the summer's candy. Planter's Peanuts had an enormous store on the walk that sold every type of peanut product available along with the traditional hot, roasted peanuts. Dinner out meant Captain Starn's for seafood, including steamed clams and New England lobster.

For me, the best part of Atlantic City was that which had to do with the ocean. From the age of seven on, I had always wanted to be a diver. My heroes were men like Jacques Cousteau. So, while

others rode their bicycles in the mornings, I went fishing. Afternoons, of course, were spent on the beach. Evenings were spent walking the boardwalk, looking in the arcades, or when I could cajole my grandparents, riding the carnival rides. It wasn't too tough to convince them. The only exception to this routine was the evening the TV program Sea Hunt was on. Then, I was propped in front of the TV while everyone else maintained complete silence.

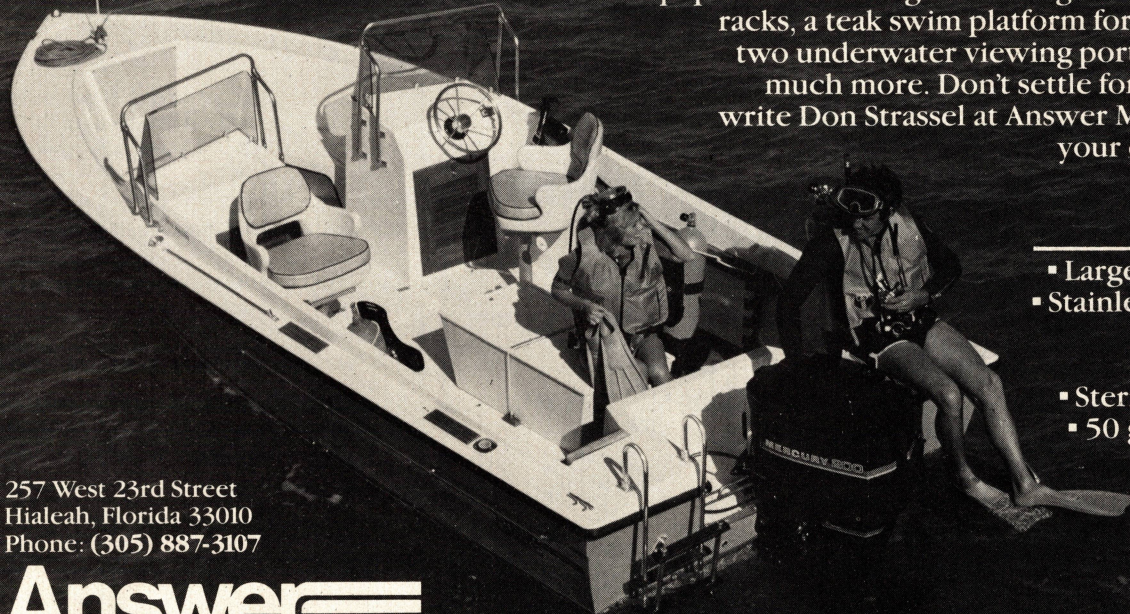
Better even than all of this, however, was the diving bell which adorned one of Atlantic City's piers. For 50¢, you could crawl through the submarine hatch on the side into the metallic wetness inside. With the door dogged tight, the bell was swung over the side and dropped into the greenish-brown sea below. Inside, while the operator talked via telephone to the crane operator above, I pressed my nose against the glass port, hoping to catch a glimpse of a shark, an octopus or even just a small fish. All I saw was swirling brown water and an occasional air bubble, dislodged from the bell and making its way to the surface.

## New Orleans, Louisiana, 1981

It is 20 years later and obviously, things are not quite the same. My family moved to California where I took up scuba diving and became an instructor. I spent six years at the University of California earning a master's degree. I spent two years at Santa Barbara City College

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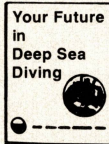
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## COMMERCIAL DIVER

learning to become a commercial diver. I spent three years in the North Sea between England and Norway diving off rigs, barges and platforms in up to 405 feet of water.

It is a Tuesday evening in New Orleans and I have just finished cooking dinner when the telephone rings. It is our company operations manager and he wants me and my dive gear at the local, private

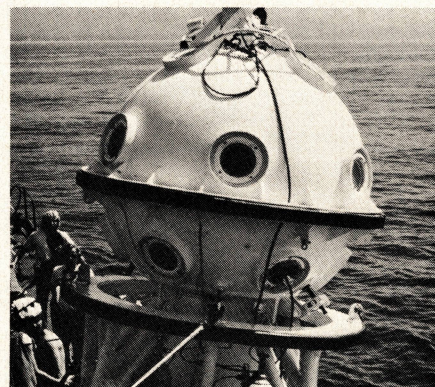


photo / Steven Barsky

Diving bell being lowered over the side.

airport at 11:00 pm. I am going to Atlantic City, New Jersey to make a dive on an oil rig in 425 feet of water.

Five of us board a small, six passenger plane at midnight as the fog comes rolling in off Lake Pontchartrain. It is a five hour flight to Atlantic City. We fly above the clouds in bright moonlight.

We land near dawn at Bader Field after circling over the brilliantly lit city. Now there are gambling casinos. There are piers, too, and I wonder if the diving bell is still there. Probably not.

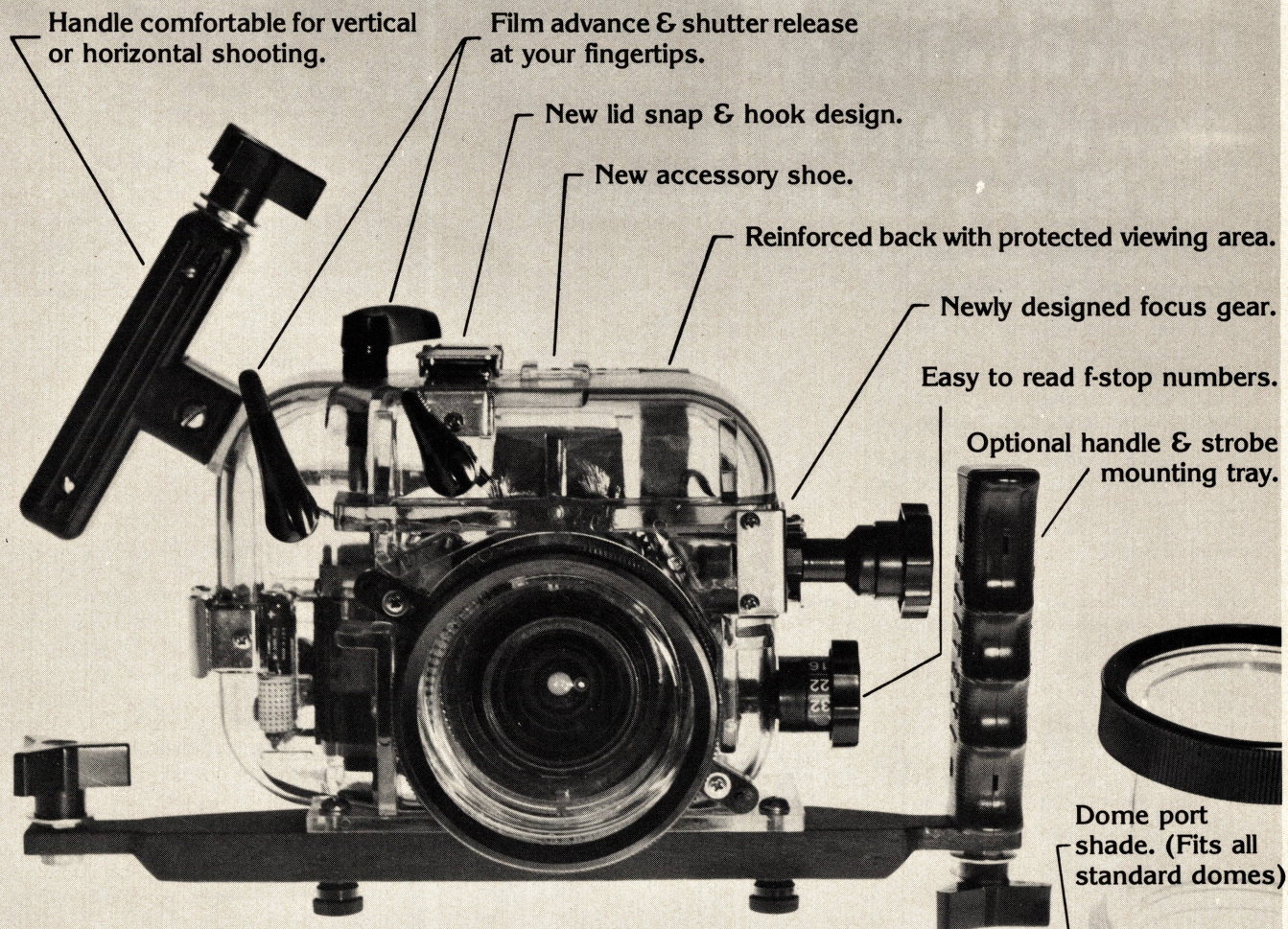
Breakfast is in a small coffee shop a block from the airport. The waitress looks disinterested, the food is greasy. We kill time waiting for a 9:00 am chopper out to the rig.

The helicopter arrives and we board it along with our pile of equipment. It is an hour's flight to the job. Mostly, everyone sleeps. I watch for fishing boats and other rigs. We circle our floating destination once, land and hustle our bags below. The customer's representative, our client, meets with us immediately and tells us that the problem on the bottom involves a well control structure which will not latch properly on the wellhead. Our dive will be to assess the situation and determine what is wrong.

Breathing gas is put on line, hydraulics are fired up, the hot water machine is fueled and started, the diving bell is thoroughly checked. My partner will lock out of the bell while I tend and act as safety diver. Everything is ready and the rig personnel give us the go ahead. We pull on our hot water suits, climb into the bell and close the bottom hatch. The bell



# THE BEST KEEPS GETTING BETTER

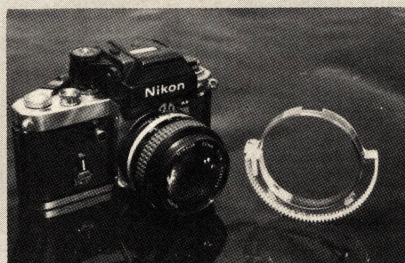


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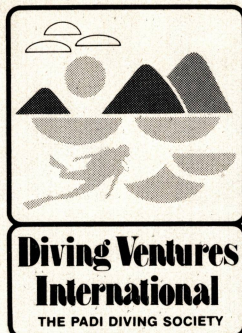


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## COMMERCIAL DIVER

swings up into the air, the support grating is drawn back, and we are lowered into the water. I confirm with the dive supervisor that we have a seal on the hatch, that is, we are not taking on water. We continue to descend.

At 400 feet the light from the television mounted on the well control structure, or blow out preventer, comes into view. We stop the descent of the bell and ready my partner for his dive. Fins on, hose connected to his harness, hot water plugged in, we signal topside that we are ready to begin pressurization. Inside the bell, we open the blow down valve and gas comes roaring into the pressure chamber. I watch the internal depth gauge as it slowly climbs; 100, 200, 300 feet. At 425 feet the gauge inside the bell reads the same as the external depth and the bottom hatch pops open. I secure the helmet on my partner's head and he drops into the icy Atlantic. I look through the port and watch him swim over to the wellhead. There are foot long squid around, and a wolf eel slithers behind him, unseen except by me. This is definitely better than it was 20 years ago. I watch the gauge indicating the pressure of the gas being fed my partner. If it should drop to zero, I would immediately switch him over to the emergency supply we carry on the outside of the bell. The needle rises and falls with his every breath.

Two hundred, thirty minutes later we have completed our work. Ten more minutes and our bodies would have been totally saturated with helium for that depth. As it is, we will end up with almost three days of decompression in a chamber in which we can't stand up. We close the bottom hatch, then the top hatch, and the bell is brought to the surface. Once on deck, the bell is mated to the decompression chamber. The chamber is heated but the humidity is almost 95 percent. Sweat rolls off our bodies continuously. There is no toilet in the chamber and there is no shower. There is a small medical lock through which food can be passed.

At the end of our decompression we exit the chamber. To ensure that neither of us has a problem with the bends, we remain on the rig for 24 hours. Then, a helicopter picks us up and takes us to the beach.

I debate with myself whether or not I should spend a day in Atlantic City before returning to New Orleans. Ultimately, I decide I really don't want to know what it's like now. I have seen the difference between juvenile fantasy and adult reality. My better judgment tells me that things are probably just not the same.



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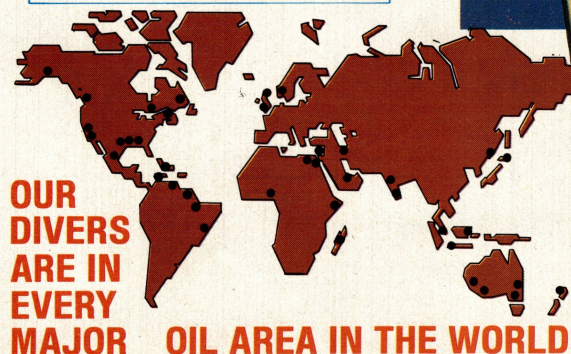
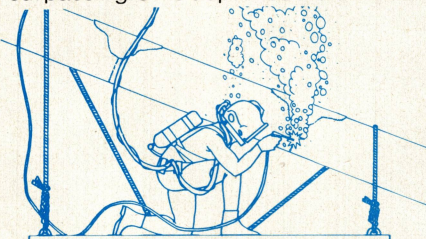
Oceaneering International designed Commercial Diving Center's training programs, moving over 40% of the graduates into key jobs under world-wide diving contracts. The others may opt to work for some 200 diving contractors who look upon C.D.C. as a producer of high-quality trainees ready to take on any job with any type of equipment.

## The reason is:

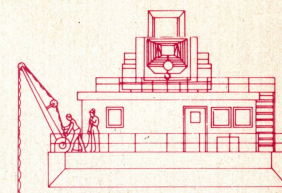
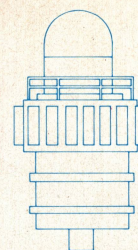
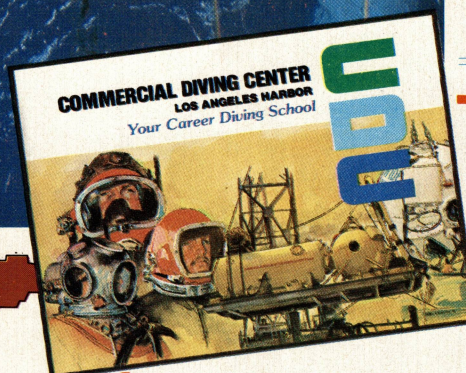
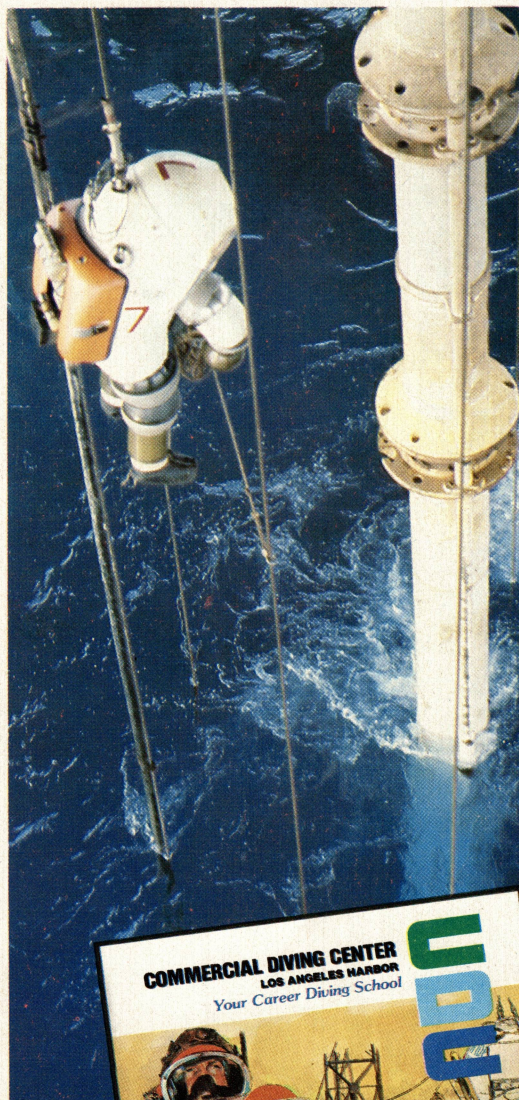
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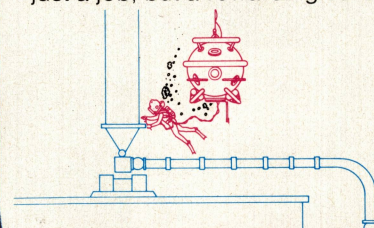
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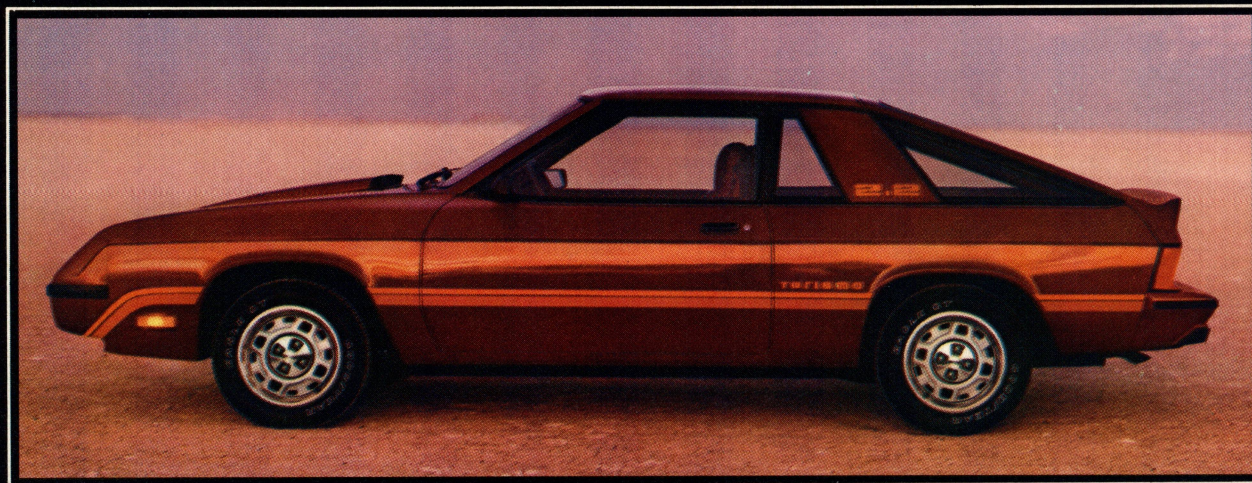
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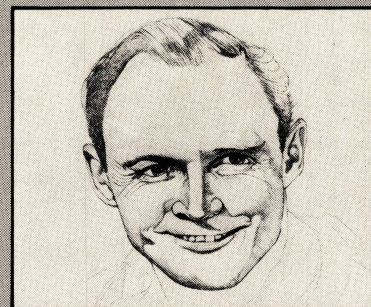
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# Technifacts

BY E.R. CROSS



**T**here are many sources for the occasional oil pollution that turns our pristine beaches and ocean waters into slippery black messes: natural oil seeping from the ocean floor; runoff from on-shore spills; motors and bilges of both recreational and commercial vessels; and tankers. The much dramatized tanker oil spills are often blamed for the world's marine pollution while, in fact, fully two-thirds of all oil finding its way into the sea comes from sources other than tankers.

The amount of oil pollution from tankers and other sunken vessels could be reduced dramatically if salvage personnel, particularly divers, were aware that equipment and techniques are presently available to safely salvage the oil —

even in deep water. The major problem in past recovery attempts has been the threat of explosion from gasses released from the oil that collect in pockets within the vessel.

Salvage of oil from sunken vessels of various sorts has been successfully conducted on at least three previous occasions. Divers also routinely and safely recover oil, or prevent the loss of oil, from underwater pipelines.

The critical piece of equipment required is known as a hot tap machine. The first successful recovery of a cargo of oil by the use of this machine took place in the summer of 1970. A tanker had broken in two and sank in 100 feet of water off Cerberus Rock, Nova Scotia. The equipment and procedures

used in the recovery of 1.5 million gallons of bunker C fuel oil from the stern section of the vessel were almost identical to equipment and procedures used to safely install fittings on active oil pipelines.

Basically, a hot tap machine is a large air or hydraulic-powered cutting tool with either a drill bit or a circular metal cutting saw, depending on the size hole needed in the plate or pipe. For underwater operations a hydraulic unit is far superior to an air driven unit and, in deep water, may be the only power that will work well under all conditions. Figure 1 shows the construction and parts of a Williamson-Hillco model 660 hot tap machine, the type that has been successfully used in oil cargo salvage.

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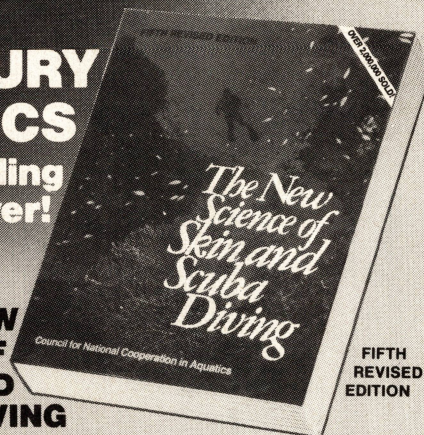


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## TECHNIFACTS

The piece of equipment required to safely fasten the hot tap machine to the hull of the vessel without the necessity of cutting with a torch is a velocity power driver. This tool derives its actuating force from powder cartridges similar to those used in rifles. Most velocity power tools consist of a chamber to hold the cartridge, a spring-loaded firing pin assembly, a barrel and the rivet or other tool required to perform the desired operation. These tools come in .22, .38 and .45 calibers. Color coded cartridges are available for light, medium and heavy charges. With the most powerful charges, the steel pins can penetrate up to one inch of steel plate. This will give a holding power of approximately 8000 to 10,000 pounds. Four such pins driven through the hot tap nozzle and the deck, or hull, of the vessel (see Figure 4) will provide adequate strength to permit use of the largest hot tap tool.

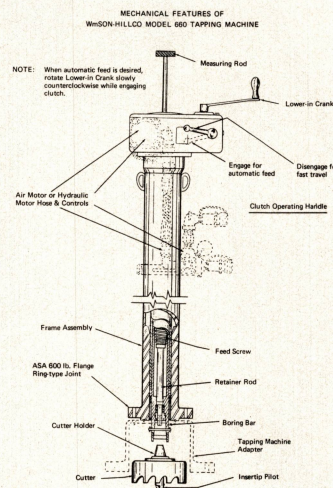


Figure 1

Salvage personnel and divers who are going to use a hot tap oil recovery procedure should obtain the operation and maintenance manual for the Wm-Son-Hillco tapping machine model 660. Write to T. D. Williamson, Inc., PO Box 3409, Tulsa, Oklahoma 74101. Study the manual carefully before attempting to use these versatile machines.

Figure 1 shows the mechanical features of this tool. Figure 2 is a photograph of the machine with a saw cutter blade similar to the one in the sketch. Figure 3 shows the model 660 machine installed and in use cutting through an oil field fitting. These machines are quite large and heavy and will require the use of float bags underwater.

The salvage of oil from a sunken vessel is a major undertaking involving floating equipment for divers, barges to accommodate the cargo of oil (that

Illustrations/courtesy T. D. Williamson, Inc.



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## TECHNIFACTS

might be in the millions of gallons), cranes and, if in deep water, saturation diving equipment, decompression chambers and dozens of trained personnel qualified in this type of work.

To keep the amount of spilled oil to a

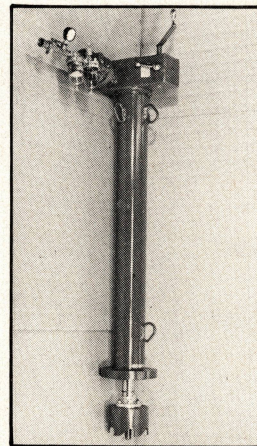


Figure 2

minimum, or to prevent any spill, the first step in oil salvage is to have divers inspect the hull for damage. All leaks in the hull and fittings should be stopped. Almost always there will be some leakage from cracked pipes and from the decks (which are usually the tank tops), that can be made tight by divers.

While this work is in progress, decisions must be made as to which tanks within the hull should be emptied first and how many will have to be emptied. Once this decision has been reached, the necessary fittings for attaching the hot tap machines can be made.

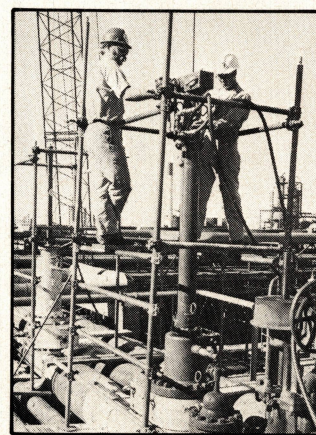


Figure 3

At least one complete assembly for attaching the hot tap machine must be made for each tank to be emptied. The assembly in Figure 4 shows the nozzle, or flanged deck plate, that has been riveted to the hull of a tanker by using the velocity power rivet gun. This particular system used eight inch pipe welded to a

(Continued on Page 68)



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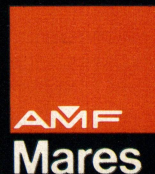
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## An Inside Look at the Bauer Compressor Co.



TEXT AND PHOTOGRAPHY BY BILL GLEASON

Not too many divers trace the history of diving back to the Industrial Revolution. But, until compressors capable of pumping high pressure air were developed, men were limited to brief breath-hold dives beneath the sea. Untold treasures were lost in shipwrecks in the past in depths that today's sport divers visit on every dive vacation. The advent of the age of heavy machinery initiated the development of the classic hardhat diving technology. Man was ready to begin his study of the sea in earnest.

Helmeted divers, tethered to the surface with cumbersome lines and air hoses, used the new technology for exploration and salvage. The compres-

sors, in the early days powered by steam, opened new opportunities for construction and harvesting the wealth beneath the waves. As metal technology increased and scientists found stronger alloys capable of holding great pressures in small containers, it became technically possible to pump enough air into a cylinder to last for an hour's excursion underwater. Diving began by linking the force of the compressor with compressed air cylinders and adding the demand regulator. With the birth of scuba in the early 1940's came increased interest in clean, high-pressure air for use in the blossoming sport.

Even today, the compressor is the

least understood link in the chain of compressor, tank and regulator. Every diver knows what one is, but relatively few know how it works. In its simplest terms a compressor is easy to understand. You take a source of power (diesel, electric or gasoline motor); use it to drive cylinders in the compressor block to deliver a stream of high pressure air; and third, purify this air to ensure that it will be safe for breathing at depth.

I learned this simple explanation of compressors on a recent trip to Norfolk, Virginia, the home of Bauer Breathing Air. One of the leading manufacturers of compressors in the United States, Bauer sells a complete line of dive and industrial units. I met Chuck McCoy, Bauer's national sales manager, in the company's modern administration building. Then McCoy took me on a guided tour of Bauer's manufacturing facility. Now that's the place to learn about compressors. Far from being a complicated industrial complex, the plant has a very ordered, rational work flow that made it easy to see how compressors were made. You start with a basic compressor block, assemble some parts to it, add a power source and a frame or cabinet, attach a purification system, and you've got a compressor. All phases of manufacturing and assembly flow toward one final area; the testing and final quality control check-

*(Continued on Page 78)*

Some occasions demand a splash of something better than vodka.



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# Australia

travel guide











# Australia

**World's largest  
and most  
magnificent  
coral wonderland**

*Text and photography by Geri Murphy*

**T**here is a land far, far away where people speak the same language we do but the animals are strange and different. Kangaroos the size of antelope bounce along like big rabbits while cuddly koalas cling to trees like contented teddy bears.

This land is an island of enormous size, yet it is sparsely populated. It is as large in area as the United States, but the population approximates that of New York State. There are great forests, vast deserts and fertile farm areas. The people will tell you about a cattle ranch that is larger than the state of Texas.

The people who live in this land are very friendly, extremely talkative and have a good sense of humor. They even laugh at Johnny Carson's jokes. They love Americans because we are so much like them and tourists are treated like royalty.

One of the natural wonders of this land is a gigantic coral reef. It is the largest living thing on earth, and, inhabited by the most exotic creatures man has ever seen. This remarkable coral galaxy is one of the reasons why so many divers are eager to visit this distant land. There are strange and wonderful sights to behold on this fairytale reef. Clams grow to 500 pounds, anemones measure four feet across and starfish are bright, electric blue. You can hand-feed fish that weigh 150 pounds, photograph seven foot moray eels and see a dozen different nudibranchs on a single dive. One diver encountered a school of 2000 manta rays — and has the picture to prove it!

What is this land of incredible sights and experiences? It's Australia, of course, the most exciting vacation destination in dive travel today.



# Australia

Australia is far across the Pacific and south of the equator. Because it is below the equator, the country is often called the "land down under." The distance from San Francisco to Sydney is 7420 miles and it is almost 10,000 miles from New York.

## FLIGHTS

There are more than a dozen international air carriers serving Australia and bringing visitors from Europe, the United States, Asia and the Orient. The best known is Qantas, Australia's flag carrier. Using 747 jets, Qantas operates daily flights from San Francisco to Sydney, with a two hour stopover in Honolulu. Qantas also operates flights three times a week from Los Angeles to Sydney with



747 TransPacific Jet

**Qantas makes daily flights from San Francisco and Los Angeles to Sydney, Australia with a stopover in Hawaii or Tahiti. There is also a Saturday flight which takes passengers directly to the city of Townsville.**

a brief stopover in either Hawaii or Tahiti.

The newest and most exciting service offered by Qantas is Saturday flights from Los Angeles to Townsville, a seaport city in the middle of the Queensland Coast. Divers can fly directly from California right to the heart of the Great Barrier Reef area.

Flights from the U.S. to Australia average 17 hours, including the two hour fuel stop at Honolulu or Tahiti. You depart from the U.S. in the late evening and arrive in Australia early the next morning. However, you lose a calendar day because you have crossed the International Date Line.

## ENTRY REQUIREMENTS

To visit Australia, you must have a current passport. Birth certificates and voter registration cards are not acceptable proof of citizenship as they are in the Caribbean. Prior to departure you must also obtain an Australian Visitor's Visa. This should be done three to four weeks ahead of time. You can obtain an application form from the Australian Consu-

late-General who has offices in San Francisco, Los Angeles, New York, Chicago, Honolulu and Washington, D.C. The completed application form must be returned to the Consulate-General's Office along with a passport photo, your valid passport and a self-addressed return envelope. There is no charge for the visa itself. Allow 21 days for visa processing and return by mail. If you are in a hurry, you can visit the Consulate-General's Office in person and obtain the visa within three to four days.

## MONEY

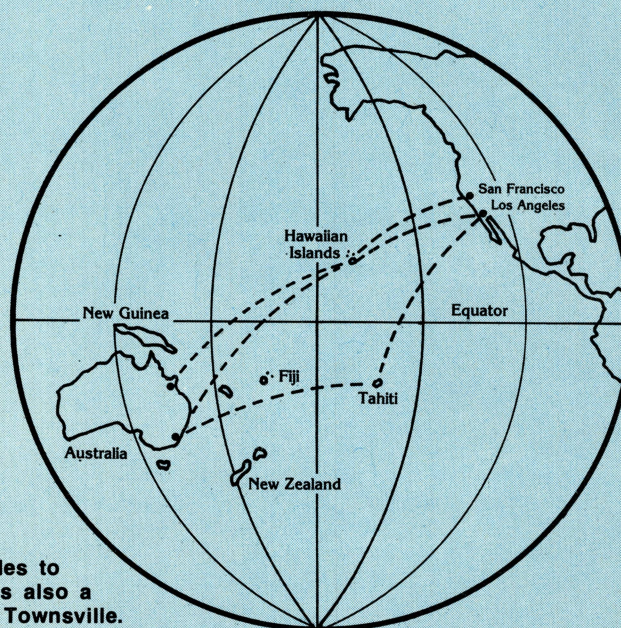
When visiting Australia, you are going to need Australian money, as U.S. dollars are only acceptable in large hotels in the main cities. You will need Australian dol-

gent health and food regulations to be found anywhere in the world. You can drink a glass of water direct from the tap without worry. Fresh fish and other seafood are abundant. Beef and lamb are exquisite and Australian wines compare favorably with California and European brands.

Australians have the same basic diets as Americans and most dishes are quite familiar. Australia also offers a wide range of ethnic restaurants which serve Italian, French, Japanese and Chinese food. You can even get a pizza!

## CLIMATE

Because Australia lies south of the equator, the seasons are the reverse of ours. Spring runs from September to



lars for cab fares, tips, restaurants and shopping.

Australia has the same currency system as the U.S., but their dollar is worth more than ours. The present currency exchange rate is \$1 Australian to \$1.11 U.S., but this rate can fluctuate. You can obtain a little Australian spending money at the San Francisco or Los Angeles airports prior to departure.

## ELECTRICITY

The Australian electrical system is basically 220 to 240 volts on 50 cycles AC current. The electrical outlets are designed to accept a two or three pin plug that has flat blades in a V-configuration. These outlets will not accept an American made plug. If you are planning to bring along any U.S. made appliances (110 volts) you will need to obtain an adapter plug and a voltage converter. These can be obtained at luggage, hardware and department stores.

## FOOD

Australia has some of the most strin-

November and summer is from December through February. The Australian fall runs from March to May and winter is from June to August.

As far as weather on the Great Barrier Reef is concerned, it is eternal spring and summer. The Queensland Coast and adjacent Great Barrier Reef are in the northeast part of Australia, closest to the equator. The climate is very similar to that of the Florida Keys and Caribbean.

## TRAVEL INFORMATION

Australian Consulate-General  
360 Post Street  
San Francisco, CA 94108  
(415) 362-6160

Australian Tourist Commission  
3550 Wilshire Blvd.  
Suite 1704  
Los Angeles, CA 90010  
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# Australia Dive Scene

The resort dive scene in Australia is much different than in the U.S. or the Caribbean. Australia is vast in size and a visitor must plan on traveling long distances from one dive area to another. Diving is from boats and most of the best spots can only be reached by large live-aboard boats that can cruise hundreds of miles and stay out to sea for many days. In other words, Australia is not the kind of place where you can rent a camper and go beach diving along the coast.

## GETTING AROUND

Your arrival in Australia is not necessarily the end of your travels but instead only the completion of the first leg. Whether you land in Sydney or Townsville you will probably have to continue onward to another city somewhere along the Queensland Coast.

Most of the live-aboard dive boats which cruise the Great Barrier Reef and Coral Sea are at Cairns or Townsville. In order to reach Heron Island you must first go to Gladstone, which is the helicopter

departure point for this island retreat. In order to reach South Molle Island, you must first go to Proserpine and catch the ferryboat. The distances between these various Australian coastal cities can range from 200 to 700 miles.

The best way to get around is by traveling aboard Trans Australian Airlines. TAA is one of the two large internal airlines which provide modern jet service to practically all Australian cities. It is an extremely well run airline with the latest types of aircraft including A-300 Airbus, 727 and DC-9 jets. These flights are fast, frequent and fairly inexpensive. For example, TAA operates five flights daily from Sydney to Brisbane, the gateway city for the entire Queensland Coast. The flights are aboard 727 or A-300 jets and take one hour and 15 minutes to cover the 500 miles between the two cities. At the Brisbane Airport, you change planes for various flights to half a dozen coastal cities such as: Gladstone, Proserpine, Townsville and Cairns.

Another good way of getting around the Queensland Coast is to fly with Air Queensland, formerly known as Bush Pilot Airways. Air Queensland is headquartered in Cairns and operates a fleet of propeller type aircraft. There are regularly scheduled flights to all of the coastal cities including, Townsville, Proserpine, Gladstone and Brisbane.

## AUSTRALIA INFORMATION

Trans Australia Airlines  
510 W. 6th Street  
Los Angeles, CA 90014  
(213) 626-2352

Queensland Travel  
& Tourist Corp.  
3550 Wilshire Blvd.  
Los Angeles, CA 90010  
(213) 380-6060

Air Queensland  
George Fehling  
60 East 42nd Street  
Room 1504  
New York, NY 10165  
(212) 697-3694

## TYPES OF DIVING

There are basically three types of dive vacations available in Australia today. All three have advantages and disadvantages, but each is equally rewarding and well worth the long journey to Australia.

The first type of dive vacation involves a visit to one of Australia's offshore islands. These lie 5 to 50 miles off the Queensland Coast, but are still inside the Great Barrier Reef. They are land based resorts: You stay in a comfortable hotel room and go out on half-day boat trips to surrounding reefs. While the visibility is considerably less than the Coral Sea, the marine life on these inside reefs is abundant. They are macro fairylands filled with an incredible array of colorful creatures. The island resorts also offer occasional day trips to the outer edge of the Barrier Reef, but their range is limited.

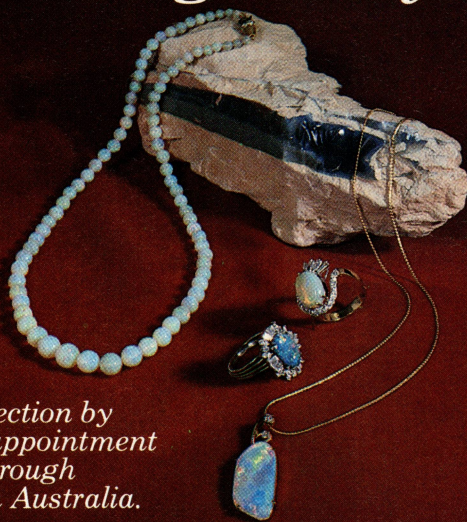
The second type of dive vacation is a cruise along the Great Barrier Reef aboard one of several live-aboard boats. These cruises can run from 5 to 10 days and cover a distance of up to 400 miles. The Great Barrier Reef trips provide an excellent opportunity to dive many of the remote and untouched spots far from the major coastal cities. Sites such as the Cod Hole, Dynamite Pass and the *Yongala* Wreck are legendary.

The third and most exotic type of dive vacation is a cruise to the Coral Sea aboard one of the extended range live-aboard boats. This is the most expensive type of cruise, but well worth the additional money. Divers have an opportunity to visit uninhabited coral atolls and reefs 100 to 300 miles offshore — where the visibility is spectacular and the marine life awesome.

## DIVE BOATS

The Australian dive boats are highly specialized vessels designed for long cruises. They are totally self-sufficient. They carry air compressors, scuba tanks, a large freshwater supply and food to stay at sea for 5 to 12 days. They

*In the country of opal,  
our range and reputation  
is legendary.*



*Inspection by  
special appointment  
through  
Dive In Australia.*



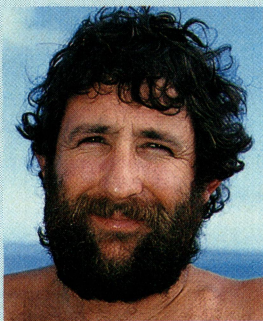
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are equipped with the latest high seas radio transmitters, sophisticated navigation equipment and auxiliary tenders used as dive skiffs. Boats cruising the Coral Sea are equipped with special satellite navigation equipment and expensive sidescan sonar for pinpointing submerged reefs.

At present, there are less than a dozen of these special live-aboard boats that can accommodate divers comfortably and can find those secret locations. These vessels include the: *Reef Explorer*, *Auriga Bay*, *Reefseeker*, *Dive-master*, *Bali Hai II*, *Mantaray*, and *Coralita*. They range in size from 50 to 90 feet and can accommodate 10 to 16 divers. The cost for sailing aboard one of these vessels can range from \$130/day to \$300/day depending on the luxury level of the boat and its destination. Most of



David Loughnan



TAA operates daily flights from Sydney to all major cities on the Queensland Coast.

these boats are either at Cairns or Townsville.

It is worth pointing out that these boats are operated by some of the finest crews in the world. The skippers are highly experienced, with tremendous knowledge about Australia's reefs, currents and weather patterns. These men, and their boats, are frequently chartered by the government for oceanographic surveys and reef ecology studies.

### BOOKING TRIPS

The dive boat operators of Australia have developed a unique and structured system for accommodating vacationing divers from the U.S. and other countries. The majority has formed an association called Reef Explorer Cruises through which crew members and skippers are shared, while high standards of safety are maintained. The boats in this asso-



The fabulous underwater attractions found on the Great Barrier Reef and the Coral Sea await divers off the Queensland Coast, approximately 1000 miles north of Sydney.

ciation are represented by a company called Dive In Australia, which has offices in Sydney. As their worldwide sales representative, it is the job of Dive In Australia to coordinate booking dates and reservations aboard the various boats.

Dive In Australia works, in turn, with various dive travel agencies in the U.S., booking people aboard the boats. The U.S. based agencies include: See & Sea Travel, Poseidon Ventures, Sea Sports Inc. and OceanQuest. In order to make a trip on one of the Australian boats, you should book your reservations well in advance, working with one of the U.S. based travel agencies. Trips are usually booked one year in advance by these travel agencies. In other words, do not expect to fly to Australia, show up at the boat dock, and get aboard one of these boats. However, there is some flexibility in the system and you may be able to take advantage of a last minute cancellation or be referred to another boat which is not completely full for the dates you have in mind. You can obtain the up-to-date information on these various dive trips by contacting the U.S. based travel agents or Dive In Australia.

Making a reservation at one of the island resorts is a bit easier since they can accommodate a great many more people on a weekly basis.

### DIVE TRIP INFORMATION

See & Sea Travel Service, Inc.  
680 Beach St.  
San Francisco, CA 94109  
(415) 771-0077

Sea Sports Inc.  
1100 FM 1960 West  
Suite F222  
Houston, TX 77092  
(713) 353-8466

Poseidon Ventures  
359 San Miguel Dr.  
Newport Beach, CA 92660  
(714) 644-5373

La Mer Diving Seafari, Inc.  
823 United Nations Plaza  
Suite 810  
New York, NY 10017  
(212) 599-0886

OceanQuest, Inc.  
139 Woodlawn Avenue  
Upper Montclair, NJ 07043  
(201) 744-5254

Dive In Australia  
680 Beach Street  
Suite 498  
San Francisco, CA 94109  
(415) 928-4480



# Heron Island

**H**eron Island is probably the most unusual dive resort in the world. It sits in the center of a 50 square mile national marine park comprised of 16 coral atolls, islands and living reefs. Heron is the only one inhabited. Heron itself is part of the park, serving as a bird sanctuary and turtle nesting ground. Heron's visitors have a rare opportunity to live on a tropical island that is part of the Great Barrier Reef system while enjoying the basic comforts of a vacation resort.

A tiny speck in a giant ocean, Heron is barely one-third of a mile long and only 330 yards wide. It is basically a coral cay covered with trees and brush and ringed by a white sand beach. The highest point is only 13 feet above sea level.

One small corner of this island is occupied by the resort, the remaining island is a wilderness refuge for 40,000 seabirds and at least six species of turtle.

Surrounding Heron Island is a vast city of coral reef structures which have built up over the last 18 million years. The island is but a tiny portion of a huge double reef system which stretches for miles. You can actually walk on the top of this reef during low tide, visiting hundreds of intriguing tide pools, deep crevices and tidal channels.

## LOCATION

Heron Island is near the southern end of the Great Barrier Reef. It lies 50 miles off the Queensland Coast, right on the tropic of Capricorn. The climate is perpetual summer with temperatures ranging between 75 and 90 degrees. The outer edge of the Great Barrier Reef is only 12 miles away.

## GETTING THERE

To visit Heron Island you must first travel to Gladstone, a seacoast city opposite the island. From Sydney, you can fly north aboard TAA to Brisbane, change planes and continue your flight along the coast to Gladstone. From Townsville, you can fly south to Gladstone aboard Air Queensland.

At the Gladstone airport you then transfer to Heron Island Helicopter Service. This airline has four helicopters which can carry four to six persons per flight and operate all day long. You fly the last 50 miles in 30 minutes while skimming the Barrier Reef at an altitude of 1500 feet. The view is breathtaking!

## THE RESORT

Heron Island Resort is certainly not fancy but it is comfortable and clean. It is sort of a cross between summer camp and the Parrot Jungle Zoo. The resort has a tropical village atmosphere: Its 35 small buildings are scattered among the trees. Footpaths or narrow roads con-



Heron Island is a macrophotographer's paradise with many exotic and colorful nudibranchs.



Heron Island is a small speck of land at the southern end of the Great Barrier Reef.

nect all of the buildings and guests walk everywhere. There are no cars, trucks or motorcycles and the only form of transportation is the tractors used for hauling luggage, scuba tanks and launching the boats.

The resort has 70 rooms and suites which can accommodate up to 230 guests and yet the resort never appears crowded. The only time you ever see everyone is at mealtime when guests congregate in the giant dining room. Incidentally, every meal is delicious. Breakfast and lunch are served buffet style with fresh fruits, vegetables, meats and fish.

Recreational facilities include a large freshwater swimming pool, a game room, a cocktail lounge, a dance area, and a tennis court. Special activities include walking tours which cover more than one-half mile of the reef. Guests are provided with tennis shoes and walking sticks. There are also guided bird watching tours on which guests learn about the 20 different species of birds which live on Heron. From October to March, there are turtle watching tours, during which guests have an opportunity to see these magnificent reptiles lay their eggs.

## DIVE FACILITY

Heron Island Resort has an extensive dive shop right on the premises. It consists of an air station with three heavy-duty air compressors, an inventory of 60 or more rental scuba tanks, a fleet of four



Heron Island dive boats are launched directly from shore with the aid of a tractor.

dive boats, and a well stocked sales department. There are four dive guides who operate the boats, fill tanks, and escort the guests on reef tours.

The primary boats used for daily trips to nearby reefs are two 34 foot customs with extra wide beams. These craft will carry 24 divers each. Snorkelers and scuba divers ride on the same vessel as shallow reefs and deep dives are equally accessible at most sites. A 26 foot dive barge with a front drop ramp is used to accommodate smaller groups. A 23 foot Shark Cat, a twin-hulled high speed craft, can carry up to 12 divers.

Heron Island caters basically to experienced scuba divers and to snorkelers. There are no scuba diving classes offered and visiting divers must be certified or content to snorkel only. U.S. certification cards are recognized at Heron.

The Heron Island dive shop operates two scheduled scuba dives daily. Each is a one tank dive followed by snorkeling and free diving. The morning dive departs at 9:20 am and returns before lunch. The afternoon dive departs at 2:20 pm and returns in the late afternoon. Arrangements can be made for a full day, two-tank trip to the outer Barrier Reef.

## HERON REEFS

At Heron you will find the most beautiful nudibranchs imaginable and the dive guides will show you one after another



# Heron Island. Just the spot for a diving holiday.



Australia's Great Barrier Reef is the longest coral reef in the world.

But if you want to explore its splendors in comfort, your choice is surprisingly limited.

All but two of the island resorts are at least 30 miles from the reef. Fortunately, Heron Island is one of the two.

Fortunate because it is generally acknowledged as having the best diving in Australia, if not the world. For the beginner, intermediate and experienced diver.

In 1977 it was the venue for the World's Underwater Congress.

The cay and surrounding coral reefs have the protected status of a National Park.

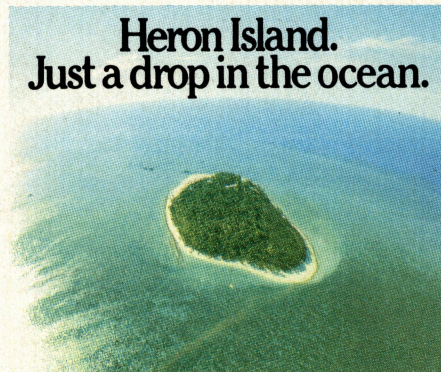
Crays and turtles parade with fish fanciful as their names: Tiny Damsels, Sergeant Majors, Humbugs and the Red Emperor and Coral Trout.

The latter two tend to make a succulent appearance at our sumptuous evening meals in the modern resort complex. Where the dive shop has pride of place with our disco and dangerously friendly bar.

If you think that Heron Island sounds just the diving spot for you, you're certainly in good company.

Your Travel Agent, Qantas, Pan Am, Continental, Air New Zealand or Lufthansa have all the details. Or drop us a line at P.O. Box 72, Hamilton, 4007, Australia.

**Heron Island.**  
**Just a drop in the ocean.**





during dives. In the months of June and July, manta rays by the dozens can be seen cruising along the reefs, often coming very close to the divers. The coral reefs of Heron Island are so exquisite and so unusual that the government declared this area a marine park in 1979. The entire area is under the supervision and protection of the Great Barrier Reef Marine Park Authority. Coral collecting and commercial spearfishing are prohibited and the law is strictly enforced.

Because Heron Island lies inside the edge of the Barrier Reef, the underwater visibility is not as crystalline as the outside edge or the Coral Sea. Visibility averages 60 feet but varies from a low of 40 feet to a high of 100 feet plus. An enormous amount of nutrients are carried with each tide, feeding the living coral polyps and small marine life that inhabit these reefs. Heron's reefs are a bonanza for those interested in macro photography or fish close-ups.

Many of the best dive sites around Heron Island are only a 5 to 15 minute boat ride from the beach. The ride is almost like taking a bus to the park. The boat anchors close to the shallow portion of the reef so that snorkelers can drift over the coral gardens while divers explore the lower portions of the reef.

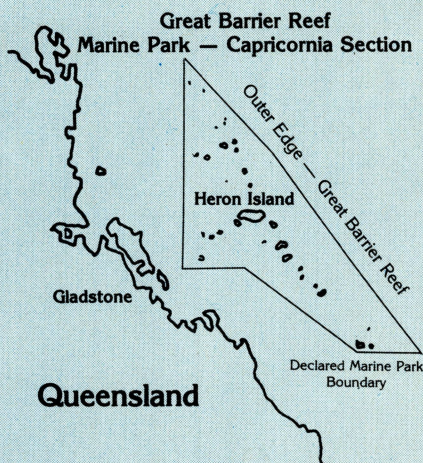
Among the best dive sites around Heron Island, **Big Bommie** would be regarded as the most popular. This site consists of six giant coral heads which rise up 30 feet from a sloping bottom. The uppermost coral head is loaded with tons of fish which are extremely tame. A school of batfish circles the top while moray eels, groupers, and snappers pose patiently for pictures and tidbits.

Another fascinating dive site is **Blue Pool**, a semi-circular indentation in a straight coral reef. Apparently this was once a completely round tide pool but one side broke away during a storm. Dive depth in the pool is an average 30 feet with the sides rising vertically to the surface. Beyond the pool, the bottom slopes gently down to a depth of 60 feet. The site is loaded with schools of snapper, giant batfish, lots of small grouper and hundreds of anemone clownfish.

Another favorite is **Gorgonian Hole** which features a broken coral wall and high heads in deeper water. Dive depths range from 10 to 40 feet and the place is loaded with orange gorgonian fans, small soft corals, Spanish dancers, and giant nudibranchs. It is also a great spot for finding scorpionfish, painted lobster, featherstars and beautiful angelfish.

### BARRIER REEF

In addition to the regular half-day trips around the island, Heron Island Resort also offers all-day excursions to the outer edge of the Great Barrier Reef and neighboring islands 7 to 15 miles away. The Shark Cat is used for these special trips as it can cruise at 40 miles per hour in calm seas. It normally takes an hour to



**Heron Island is 50 miles offshore Gladstone, and lies in the center of a marine park.**

reach the first location.

One of the most interesting dives available on the all-day excursions is a spot known at **The Keyhole**. Divers are guided to a spot on the coral reef where they enter a vertical chimney at a depth of 30 feet. The hole is seven feet in diameter and goes straight down 60 feet, where it opens into a large coral cave. The floor of the cave is approximately 80 feet deep and divers can look upward to another entrance in the roof which is shaped like a keyhole. The inside is loaded with Australian lionfish (butterfly cod) who prefer the dim light of the cave because of their sensitive eyes. Exiting through the keyhole leads the divers to the vertical face of a coral drop-off where there are often many large stingrays.

## South Molle Island

**S**outh Molle Island Resort is one of the newest Australian facilities to offer dive vacation packages. In just the last year, this beautiful resort established a complete program for visiting divers.

An entirely different type of resort than Heron, South Molle is a large, spacious, full-service property with a country club atmosphere. There are all types of recreational programs, including golf, archery, sailing, sauna and so on. Diving is but one of many activities, but is becoming an increasingly attractive feature. In attempting to compare Heron and South Molle, one can only say that the seasoned traveler would enjoy both islands for different reasons.

Although Heron is a flat, coral cay, South Molle is a hilly island of volcanic origin. While Heron sits alone in a wide open sea, South Molle is surrounded by

dozens of other islands.

South Molle measures one and one-half by three miles — 1000 acres in all. This island has also been designated as a national park because of its incredible beauty. There are numerous bays and small inlets, as well as wooded forests and rolling grasslands which are ideal for nature walks. The island is surrounded by fringing reefs.

### LOCATION

South Molle Island is just off the Queensland Coast, halfway between Heron Island and Cairns. It is approximately 290 miles north of Heron and part of a cluster of 74 islands known as the Whitsunday Islands Group.

To reach South Molle you must first fly to Proserpine, the nearest airport that accommodates commercial jets. From Sydney, you can fly north to Brisbane aboard TAA, change planes and continue northward along the coast to Proserpine. From Townsville, you can fly south to Proserpine aboard Air Queensland.

Once you arrive at Proserpine Airport, you must take a taxi or bus to Shute Harbour, 50 minutes away, where you can catch a ferryboat to the island. South Molle is only five miles off the Queensland Coast and the boat ride takes approximately 30 minutes. Or, you can take a helicopter from Proserpine Airport directly to the resort.

### THE RESORT

South Molle Resort is a miniature vacation city complete with stores, sports facilities, several restaurants and a wide selection of rooms. It can accommodate up to 500 guests at one time.

The resort offers five different types of rooms and bungalows, each with its own price level. These range from spacious bungalows along the beach to a hotel lodge with its own private courtyard. Many of the rooms are equipped with air conditioning, radio and television. This is a luxury resort as nice as any you might find in the Caribbean.

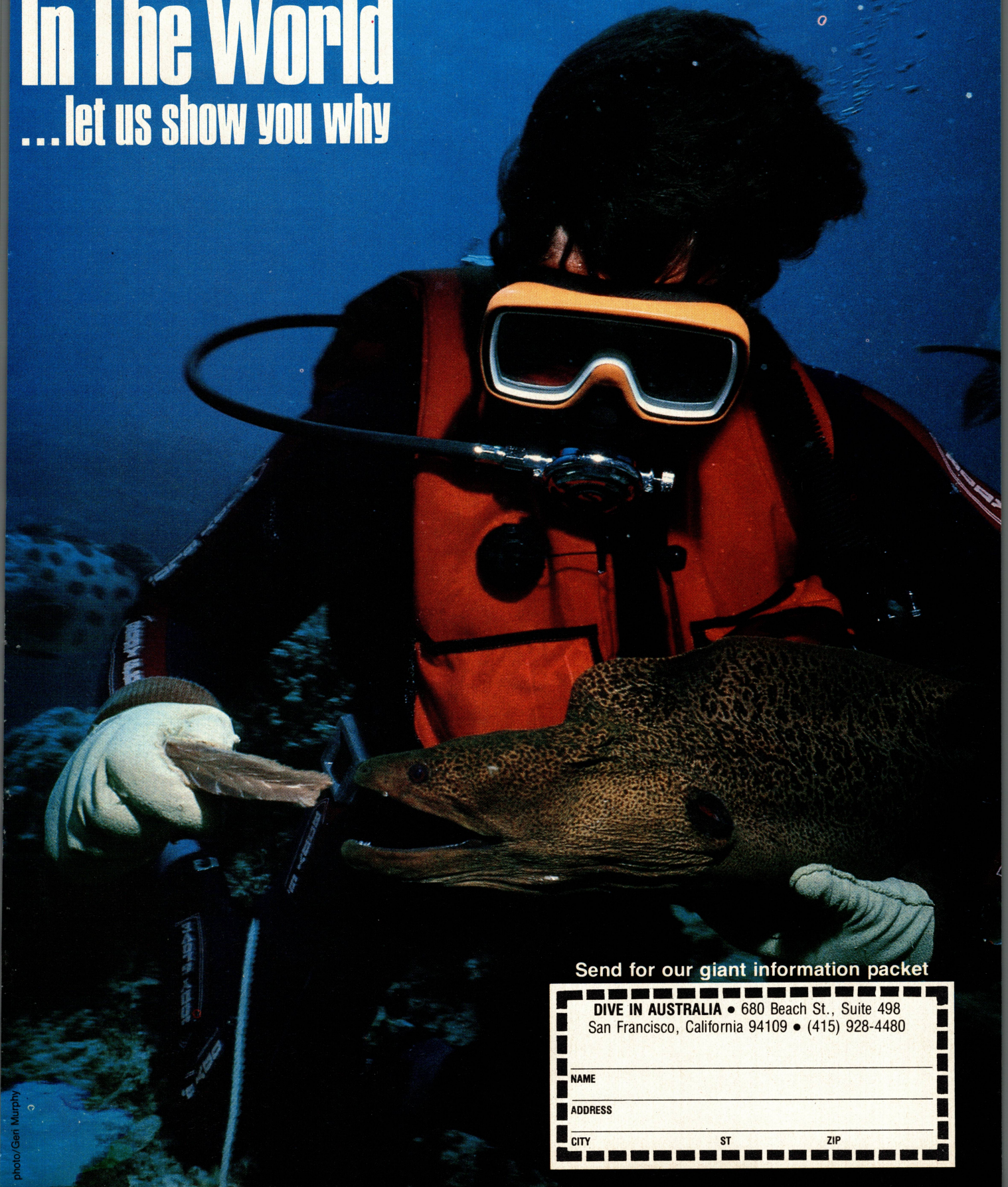
South Molle Resort has just recently spent \$5 million on an expansion program which includes more rooms and sports facilities. There is a beautiful six hole golf course, lighted tennis courts for day or night use, and a squash court with three glass sides. A gymnasium has just been constructed and there are also facilities for volleyball, badminton, quitoes, table tennis and billiards. After an exhilarating game, guests can relax in the spa or use the sauna. There are even pinball machines for the kids.

South Molle offers an equally extensive program of water sports activities. There is a beautiful Olympic size freshwater swimming pool and a large beach for sunbathers. Boardsailers are available for rent and waterskiing, sailboat rentals, fishing trips and parasail rides are also offered. Boat cruises among the Whitsunday Islands are offered daily.



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One of the high points of the day at South Molle is the 2:30 pm feeding of the wild lorikeets. A lorikeet is a tropical bird about the same size as a parakeet except its feathers are a brilliant combination of blue, yellow, orange and green. These birds live in the wild among the trees and shrubs of the island, but once a day they congregate near the golf course for a feeding orgy. The hotel staff puts out buckets of a tasty mash made of bread and honey. Hundreds of these wild birds come from all parts of the island to join the feast. The birds are perfectly tame — they will walk on your head, shoulders and outstretched arms, and feed right out of your hand.

### DIVE PROGRAM

As part of its expansion, South Molle Resort has established a full program of dive activities. Hotel guests can learn snorkeling or enroll in a basic scuba class conducted by certified PADI instructors. The resort also utilizes the expert services of Fathom Down Under which operates a fleet of four dive boats and has a total of 10 underwater guides.

The pride of the dive boat fleet is the *Rapscallion*, a 34 foot custom dive boat with a flying bridge and large stern platform. This craft carries a complete complement of scuba tanks and can cruise at 15 knots. It will accommodate ten divers for short trips and eight divers for longer excursions.

### WHITSUNDAY REEFS

There are dozens of dive sites scattered among the islands near South Molle. Most of them are living coral reefs in shallow to medium depth water, featuring 50 species of coral, dozens of tropical fish and many types of macro creatures. While the visibility is not as good as the outer reefs, the marine life is abundant. Water clarity ranges from 20 to 50 feet. Probably the best thing about these local reefs is they can be reached in 5 to 15 minutes. Dive trips are mostly one tank dives in the mid-morning and afternoon.

**Butterfly Bay** is perhaps the best of the local dive sites. This is a lovely coral garden at 30 feet, featuring tightly packed coral, colorful invertebrates and many small fish. At 70 feet there is a series of coral caves worth exploring.

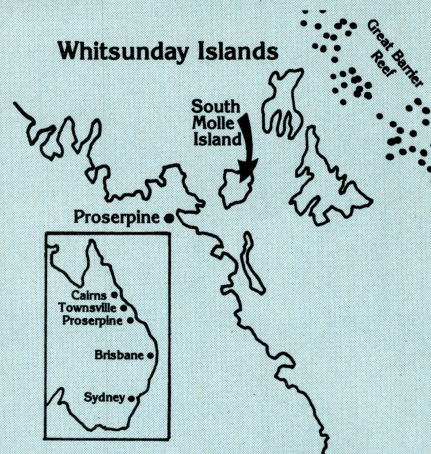
**Langford Reef** is another good spot which offers several mini-walls that begin at 20 feet and drop vertically to 60 feet. It is a good location for macro photography, with lots of blue Christmas tree worms, wildly colored nudibranchs and many different mollusks. Other good sites include **Mackerel Bay, Hazelwood Island, and White Bay.**

### BARRIER REEF SPOTS

The best dive spots lie much further out from South Molle. These are mostly remote coral reefs along the outer edge of the Great Barrier Reef. They are 30 to

35 miles away and require an all day boat trip. Full day excursions can be arranged upon request, as long as there are sufficient passengers. The dive boat generally departs at 7:00 am and returns to the resort by 6:00 pm the same day. It is usually a two-tank dive trip with lunch on board and snorkeling in between. Since the *Rapscallion* can move along at 15 knots, the trip takes only three to three and one-half hours. It may sound like a long haul, but the effort is well worth it because these outer reefs are superb.

One of the most popular dive spots is **Bait Reef**, an area comprised of tall coral heads rising up from the deep reef. One set of pinnacles is known as **Stepping Stones** because the coral formations are positioned closely together. They rise up



South Molle Island is five miles off the Queensland Coast in the Whitsunday group.



The Olympic size swimming pool at the Telford South Molle resort.



The dive boat *Rapscallion* makes daily trips to the Barrier Reef.



A daily attraction on S. Molle is hand feeding wild lorikeets.



Bright blue starfish inhabit the shallow coral reefs of the Whitsunday Islands and Barrier Reef.

from 80 feet, coming within two feet of the surface. Their vertical sides form breathtaking canyons lined with colorful gorgonian fans and delicate soft corals. This area is loaded with schooling fish and visibility usually exceeds 100 feet.

For a real thrill, you may want to try the **Drift Dive** which is conducted in a half-mile wide channel between **Hook Reef and Hardy Reef**. The channel is 10 miles long and 200 feet deep, with the current

moving briskly along at four knots. The dive provides as good opportunity to see schools of jack, giant manta rays and other large pelagics.

**Black Reef** is a spectacular drop-off with awesome fish action. Suspended off a vertical wall in crystal clear water divers have an opportunity to observe giant groupers, big tuna, and even an occasional sailfish. It is a favorite spot for both big game fishermen and scuba divers.



# An Idyllic Island base... FOR GREAT BARRIER REEF DIVING IN AUSTRALIA

Telford South Molle is a tropical Island paradise situated in the beautiful Whitsunday Passage.

PADI instructors will organise daily dives around the clear waters of the Island or full day trips to the magnificent outer Great Barrier Reef. Resort courses are also available for beginners.

Other activities available include Bushwalking, Golf, Tennis, Squash, Sailing, Windsurfing, Water Skiing and Paragliding.

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# Outer Great Barrier Reef

The Great Barrier Reef is something very special for divers. Australians describe it as, "the world's largest living thing." It is an enormous chain of living coral reefs 1250 miles long and some 10 to 40 miles wide. Its size is almost beyond comprehension — it would take a lifetime of diving to fully explore. Much of it is still virgin territory.

The Great Barrier Reef contains a staggering variety of rare and exotic wildlife. There are over 1500 species of fish identified so far and probably many more to be discovered. There are 4000 species of mollusks, including the largest clam in the world. The Reef contains 400 species of coral, 6 species of turtle and 250 species of birds. It is one of the richest and most abundant coral reefs known to man. In fact, some people call it the "Eighth Wonder of the World."

Australians are not alone in thinking the Great Barrier Reef is unique. In 1980, this ecological curiosity was nominated to the World Heritage List. It will join such well known natural wonders as: Yellowstone Park, the Grand Canyon and Everglades Park. The Great Barrier Reef was nominated to this prestigious list because it possesses rare and superlative reef formations; habitats for endangered and unique wildlife species; and because it is an outstanding example of major changes in earth's evolution.

Few places on earth hold the underwater treasures, thrills, and bizarre sights for divers that this reef does. For example, MV *Mantaray* captain Graham Warren, tells an incredible story about his friend Trevor Long who encountered a giant school of mantas while diving off the southern end of the Barrier Reef. Trevor estimated that there were more than 2000 manta rays swimming in formation like a fleet of WW II bombers. He was able to dive among these amazing creatures and photograph them with his underwater camera. One of these photos appears in the *Mantaray* advertisement in this special section. Manta rays schooling in such great numbers have never before been reported anywhere else in the world.

## THE OUTER REEF

Because of its immense size, the Great Barrier Reef has at times been a source of confusion and disappointment to overseas visitors. Like everything else in life the Great Barrier Reef has its good and bad points. One portion of the reef can offer fantastic underwater adventures while another area can be a complete zero.



A silver crinoid on an orange gorgonian.

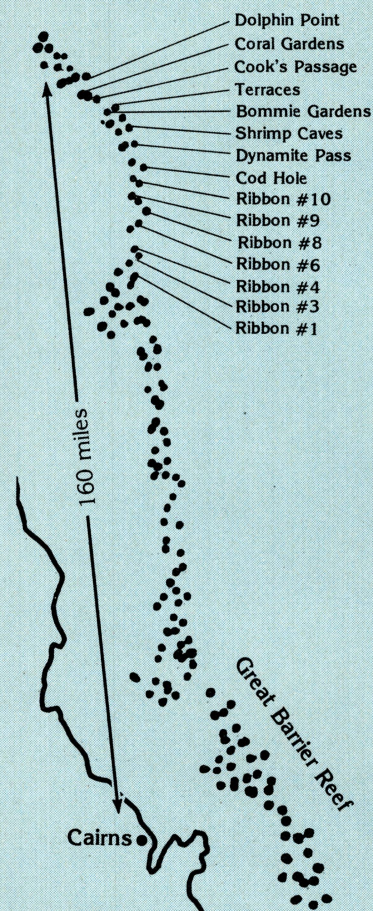
One must keep in mind the vast size of the Barrier Reef. There are large stretches, some 100 miles long, which have murky or "smoky" visibility. Large areas of the Reef offer mediocre diving, and there are some areas where you will find only sandy bottom or dead reef. Those sections of the Barrier Reef which lie close to major cities are often fished out and there are places where currents may be too swift to be safe for diving. Knowing where to go is absolutely critical and going with the right dive guide can make the difference between a spectacular dive or a disappointing one.

Unfortunately, the term "Great Barrier Reef Trip" is the most over-used advertisement in Australia. Hundreds of fishing boats, sailboats, glassbottom boats and charter boats advertise Great Barrier Reef trips for snorkeling and diving. You see these claims on tourist brochures, boardwalk signs and in the windows of practically every travel and tour agency in Australia. Such excursions are hardly the types of trips which would interest serious scuba divers or be worth a 7000 mile trek across the Pacific. If you want to sample the really spectacular diving of the Great Barrier Reef, you must get to the outer edge — well beyond the reach of tourists, fishermen and local divers.

How can you tell the difference between a "tourist cruise" and a genuine Great Barrier Reef dive trip? Your first clue is the destination. The really good dive spots are a long way from civilization. For example, the Cod Hole is 160 miles from Cairns and well out of sight of land.

Your second clue is the length of the dive trip. You cannot possibly dive the very best of the Barrier Reef in just one or two days. There is too much sailing time involved. A good Barrier Reef dive trip generally runs from 5 to 10 days in length, thus providing ample time to reach those spots where the diving is sensational.

Your third clue is the price of the trip. There is no such thing as a cheap trip or



The best dive spots on the Great Barrier Reef are many hours sail from any seaport.

bargain tour of the Great Barrier Reef. Great Barrier Reef dive trips are expensive by Caribbean standards, but this is because it takes special boats and long cruising to reach the really great spots. And, a live-aboard dive boat costs from \$350,000 to \$650,000 to build. The larger ones are worth a million or more. They are equipped with specialized navigational gear for pinpointing the good spots, plus dive gear, compressors, food lockers and so on. These boats use a great deal of fuel because they run hundreds of miles. It is no wonder that such trips are costly, but the high quality diving justifies the higher prices.

If you are planning to dive the Great Barrier Reef, the wisest thing you can do is book your trip with an Australian dive boat that has an established reputation for catering to visiting American divers. These vessels provide first class service and their crews know the precise locations of the best diving available.

## RIBBON REEFS

Perhaps the best section of the Great Barrier is a thin line of reefs known as Ribbon Reefs. These begin some 80 miles north of Cairns and extend northward 80 miles to a point slightly north of Lizard Island. Each segment is numbered and the reefs are thus known as Ribbon Num-



  
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# THE ULTIMATE DIVING EXPERIENCE.

Discover diving "Down Under" on board Australia's most luxurious diving vessel. M.V. MANTARAY takes diving trips in the unforgettable waters of the Great Barrier Reef. Extended cruises and private charter are also available to groups up to ten. For the diver, MANTARAY is totally equipped.

Tanks, regulators, weightbelts, all provided! MANTARAY accommodates in fine style in five luxury cabins, two doubles with ensembles and three with two berths.

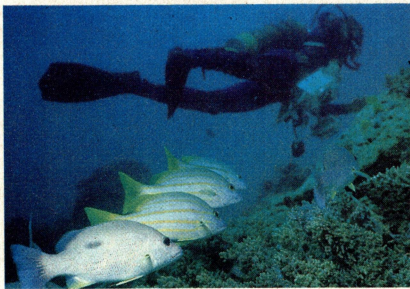
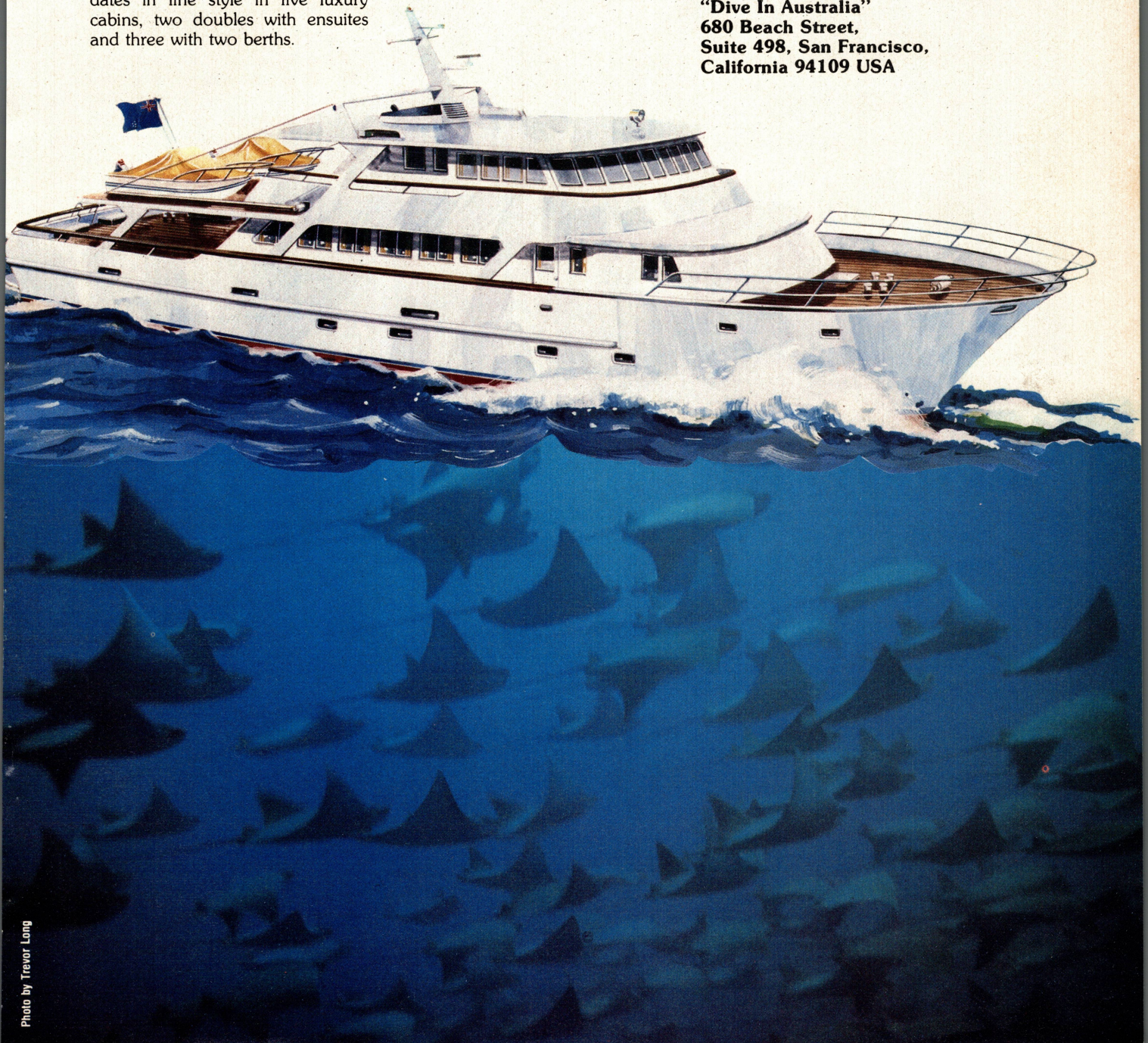


Photo by David Biddulph

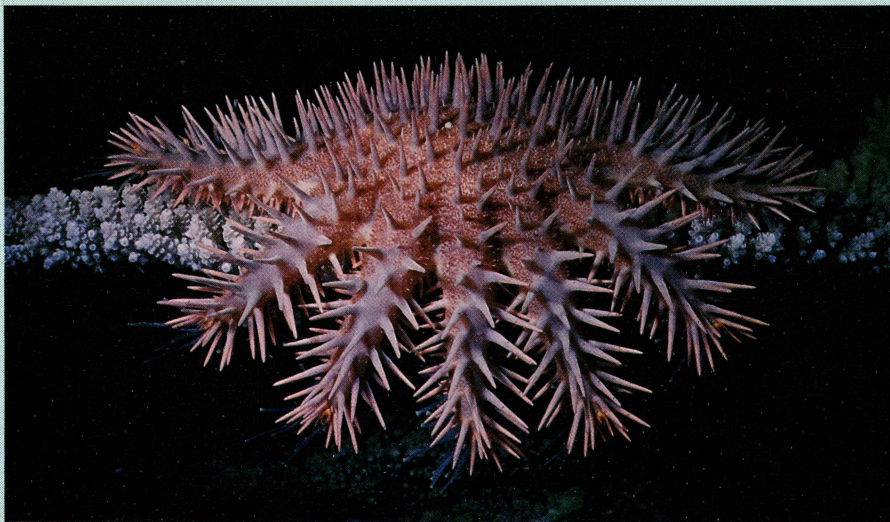
Experienced crew of five. Fully air-conditioned. Superb food. Three bars. Light game fishing equipment. MANTARAY is meticulously fitted throughout.

**Mantaray is owned and operated by  
Great Barrier Reef  
Charters of Australia.**

**For information, brochures, and  
prices, send to our Sales Agent,  
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680 Beach Street,  
Suite 498, San Francisco,  
California 94109 USA**







The crown of thorns is one of the most fascinating starfish found on the Barrier Reef.



The Auriga Bay is one of the best long-range dive boats for cruising the outer edge of the Great Barrier Reef from Cairns, over 150 miles north, to Lizard Island.

ber 4, Ribbon Number 8, Ribbon Number 9 and so on. This coral structure chain lies right along the very outer edge of the Great Barrier Reef with vertical drop-offs on one side and shallow coral gardens and lagoons on the other.

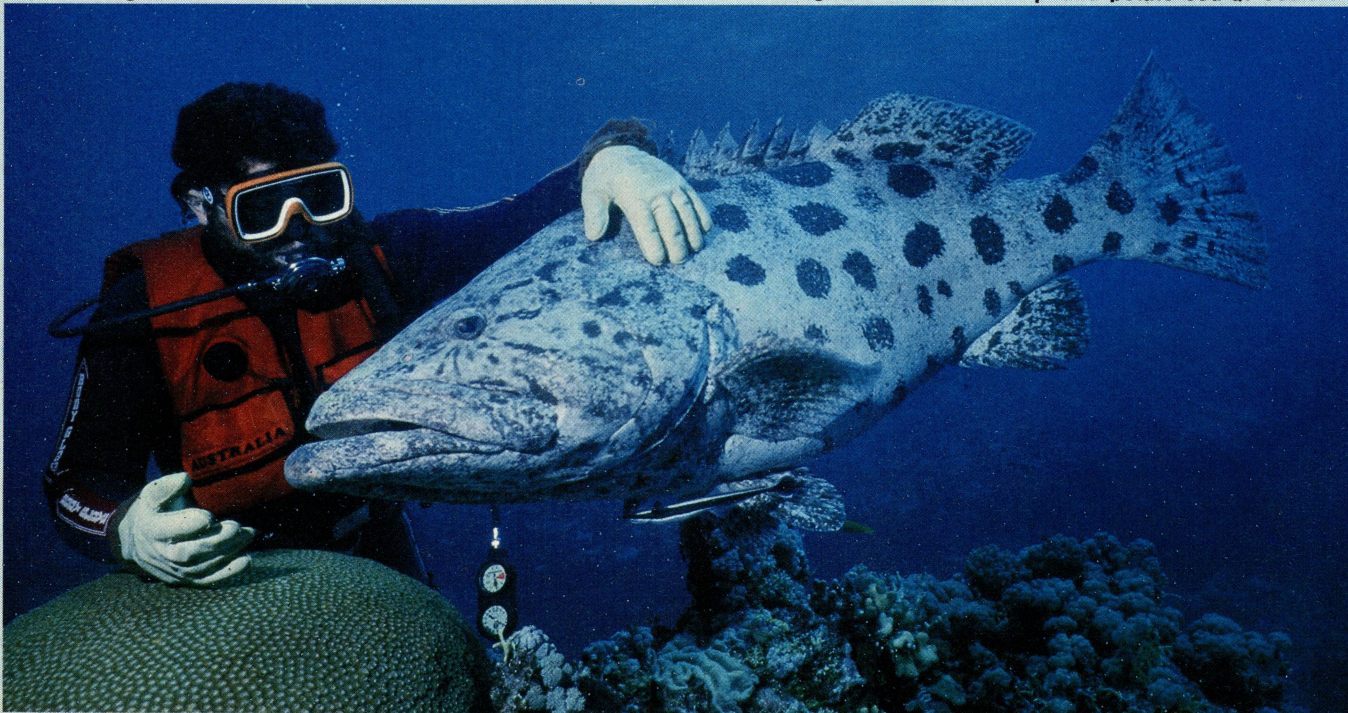
The Ribbons were first explored and charted by the *Auriga Bay* and *Reef Explorer*, Australia's first two dive boats to pioneer this remote area of the Great Barrier Reef. During the past few years, skippers Barry May and John Bound have discovered at least two dozen really superb dive sites here. Today, the Ribbons have become a popular destination for at least one-half dozen dive boats including the *Bali Hai II*, *Reefseeker*, *Divemaster* and *Mantaray*. And yet, you are not likely to see another boat on the ocean when diving this area, as there are 170 miles of open sea between Cairns and the northernmost Ribbon Reef.

### DIVE SITES

The most incredible spot among the Ribbon Reefs is a place called the **Cod Hole**. Strangely enough, this location is neither a hole nor is it occupied by cod. Instead, it is the edge or side of a pass between two coral reefs which is inhabited by an amazing family of giant groupers. The dive depth averages 50 feet. The location was first discovered by Ron and Valerie Taylor almost 10 years ago. Purely by luck, Ron and Valerie stumbled upon this colony of curious fish that immediately befriended the divers and followed them around the reef like puppy dogs. The behavior of these ordinarily shy fish was extremely unusual.

Australians call these huge creatures potato cod, but they are actually a species of white grouper with large black

One of the great thrills of a dive vacation to the Great Barrier Reef is making friends with a 150 pound potato cod at Cod Hole.





spots. The creatures vary in size from 80 to 160 pounds, yet move about with the grace of ballet dancers. They have very large mouths but tiny teeth.

There are an estimated nine or ten of these huge fish at the Cod Hole and over the past few years they have become very tame. Dive guides take down large buckets of baitfish and spend most of the dive hand feeding these gentle giants. Five or six fish will usually congregate around the dive guide, nuzzling and pushing one another to gain a better feeding position. The great fish can be petted, patted and scratched under the chin. They will stand on their heads, roll over on their sides or patiently pose for pictures in hopes of gaining additional morsels of food.

Diving with the giant groupers of Cod Hole is a thrill of a lifetime. It is like walking among a herd of wild buffalo — yet the creatures are very docile. While potato cod can be found on other areas of the Great Barrier Reef, the Cod Hole is the only place you will find so many that are so tame. In fact, it is such a rare phenomenon that the Queensland Government has declared the Cod Hole a marine park, thus protecting these magnificent creatures from extinction.

Not far from the Cod Hole is another spectacular reef formation known as **Dynamite Pass**. This unique formation consists of a fairly narrow channel between two barrier reef formations. On both sides of the channel, the coral reef comes to within six inches of the surface at low tide. The walls of the channel drop vertically from six inches to 80 feet before sloping off into deeper water. The tidal current in the channel runs a brisk three to four knots and the divers drift along the sides of the wall.

It is the vertical walls of the channel that are so spectacular. They are literally covered with brilliantly colored fans, soft corals, sponges and other exotic marine life. While drifting effortlessly along these vertical drop-offs one can view hundreds of orange or brilliant yellow seafans. Soft corals can be seen in a dozen different colors ranging from blood red to canary yellow. Clinging to the seafans are delicate featherstars in silver, white, yellow or orange. Dynamite Pass is a breathtaking experience which defies description. Visiting divers frequently request two or three dives in this one pass because there is so much to see.

As you cruise through the pass, you are likely to see just about every fish that swims in this part of the ocean. There are schooling fish of many species, giant pufferfish three feet long, large turtles, stately stingrays and clownfish everywhere. Should you want to stop along the way, it is a simple matter to duck into one of the many crevices or caves that honeycomb the sides of the channel. At one point there is a giant coral cave at 30 feet which is filled with magnificent orange seafans with beautiful featherstars

perched on them. You could spend an entire dive shooting close-up photographs in this one cave alone.

Not all of the exotic sights are on the outside edge of the Ribbon Reefs. For example, there is one spot inside the Barrier which offers the most amazing opportunity to see giant clams. This spot is simply called the **Clam Bed**. It is a shallow coral garden 5 to 15 feet deep and loaded with tightly packed corals and all types of marine life. However, the great attraction of this spot is the hundreds of giant *Tridacna* clams that are concentrated in an area the size of a football field. In some spots the great mollusks are spaced three to five feet apart and you can count a dozen or more in view at one time. The clams range in size from two to four feet across and the large ones are estimated to weigh 500 pounds each. Their fleshy mantles are a variety of colors ranging from emerald green to soft brown to electric blue.

Clam Bed is also a great place for macro photography. The coral heads are virtually covered with Christmas tree worms of every imaginable color. The most unusual ones are bright blue. There are also four different species of clownfish which can be found living among the hundreds of anemones that inhabit this reef. Still another unusual attraction is the bright blue starfish which lie on the bottom.

There are at least a dozen more unique spots along the Ribbon Reefs including: **Dolphin Point, The Terrace, Shrimp Caves, Bommie Garden and Half Mile Passage**. You could spend ten days diving these reefs and still not see all of them.

For more information about Great Barrier Reef ecology and marine conservation regulations, write to: Alistair Gilmour, Executive Officer, Great Barrier Reef Marine Park Authority, P.O. Box 1379, Townsville, Queensland, 4810, Australia.

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# Yongala Wreck

The *Yongala* is considered the best wreck dive in Australia and perhaps the best in all of the South Pacific. The concentration of fish life above and around this sunken vessel is incredible. The ocean around the wreck is like a giant aquarium without walls, as the wreck draws a great variety of pelagic fishes, acting as an invisible magnet to marine life.

The S.S. *Yongala* was a 350 foot cargo/passenger steamship which sailed along the coast of Australia in the early 1900's. At the time of her sinking, the ship was carrying timber, bricks, tires and bottled goods as well as 120 passengers. On March 24, 1911 the ill-fated vessel vanished during a cyclone. The only trace ever found was a race horse named Moonshine which washed up on a beach days later. The mystery of how or why the *Yongala* sank has never been satisfactorily answered. For years she was known as the, "Ghost Ship of the Queensland Coast." For almost 50 years the location of the *Yongala* remained a mystery — then it was accidentally discovered by divers.

Today, the location of the *Yongala* is known to a handful of dive boat skippers, and she is still a difficult wreck to find. She lies some 50 miles southeast of Townsville, approximately 11 miles offshore. There is no marker or shore ranges whatsoever and the wreck can only be located with sidescan sonar and extremely accurate navigation. This difficult access has helped preserve both the wreck and the teeming fish life that lives on it. And, recently, the *Yongala* has come under the Historic Shipwrecks Act of the Queensland government.

Today, the *Yongala* rests at a 45 degree angle on its starboard side in 80 feet of water. The hull is totally intact and the ship's rigging has only deteriorated slightly. At certain times of the year the water around the *Yongala* can be crystal clear, with 150 foot visibility. At other



The steamship S.S. *Yongala* disappeared at sea during a cyclone in 1911 and remained lost for almost 50 years. Fishermen called her the "Ghost Ship of the Queensland Coast."

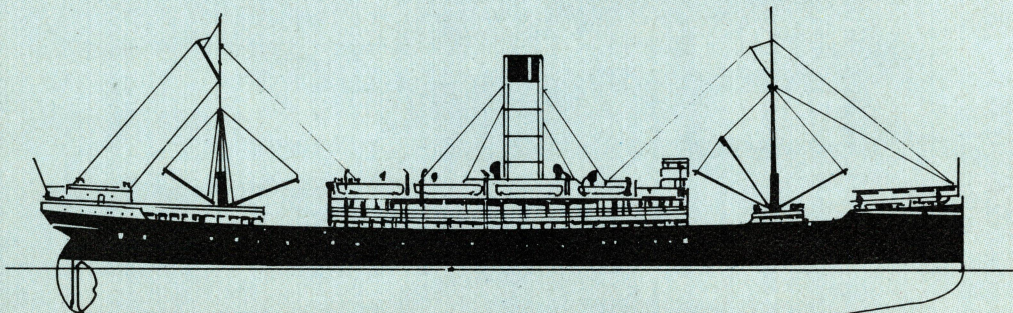
times, visibility can drop to 40 feet and surface conditions can be extremely rough. Although the ship lies inside the Great Barrier Reef, there are many miles of open ocean surrounding the site.

Upon approaching the *Yongala*, dive boat skippers and passengers frequently see turtles and sea snakes swimming on the surface. It is one of the clues to the wreck's location. Beneath the surface, at 20 to 30 feet, there is often a school of 100 Pacific barracuda that slowly circles above the wreck. Below the barracuda is a large school of stately batfish that swims just above the wreck like a group of soldiers on parade. The wreck itself is covered with a heavy growth of soft corals, seafans, hard corals and other marine growth. There are small groups of jacks, potato cod, baramundi, flowery cod, coral trout and other

medium size fish in just about every crevice and overhang.

Cruising around the outside perimeter of the ship are a dozen or more giant yellowtail jacks that must weigh 60 to 80 pounds each. Still another unusual sight is a school of 30 or more cobia which cruises around the wreck. These fascinating fish are approximately four feet long and look something like a shark from afar. The biggest fish on the wreck are the Queensland grouper. There are six of these great fish. The two largest are estimated to weigh over 500 pounds and measure seven feet in length.

A dive on the *Yongala* is an extraordinary experience which cannot be duplicated anywhere else in the world. It is an adventure that equals the thrills and beauty of the Cod Hole, Dynamite Pass or the Coral Sea.



At the time of her sinking the 350 foot *Yongala* was carrying timber, bricks, tires and passengers. She now lies intact on the ocean bottom under 80 feet of clear water.



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# The Inner Coral Sea

TEXT AND PHOTOGRAPHY  
BY MARTY SNYDERMAN

The 100,000 square miles of the Coral Sea lie off the northeast coast of Australia, between the outer portions of the Great Barrier Reef and New Guinea. But learning about the Coral Sea from a map is like trying to experience Disneyland through a postcard. It is almost as if this body of water is a world of its own. Since even the inner reefs of the Coral Sea are over 100 miles from the coastal port of Cairns, Australia, the only way to dive the area is by boat. Few ships are equipped to make such a journey, but the Coral Sea is the normal Australian springtime and summertime beat of the TSMV *Reef Explorer*.

Few people know the dive sites as well as skipper John Bound. Designed specifically for divers, the *Reef Explorer* is an all-new, steel, 63 foot long vessel that contains the latest in sophisticated navi-

gational equipment. The boat offers maximum comfort. Accommodations consist of six air-conditioned double cabins, each with closets, storage space and sinks. On the main deck, the saloon and bar provide comfortable places to relax, unless you prefer to sun on the main deck or simply enjoy an afternoon breeze in the shade of the deck.

The reefs of the Coral Sea are rather small compared to the vast expanse of the open sea surrounding them. But the sophisticated satellite navigator, echo sounder, and 360° sidescan sonar enable the crew to quickly locate dive sites. And, all of that equipment is necessary, for in the Coral Sea you are truly "in the middle of nowhere."

The *Reef Explorer's* large, stable, stern dive platform makes water entry and exits a snap. An eager crew provides

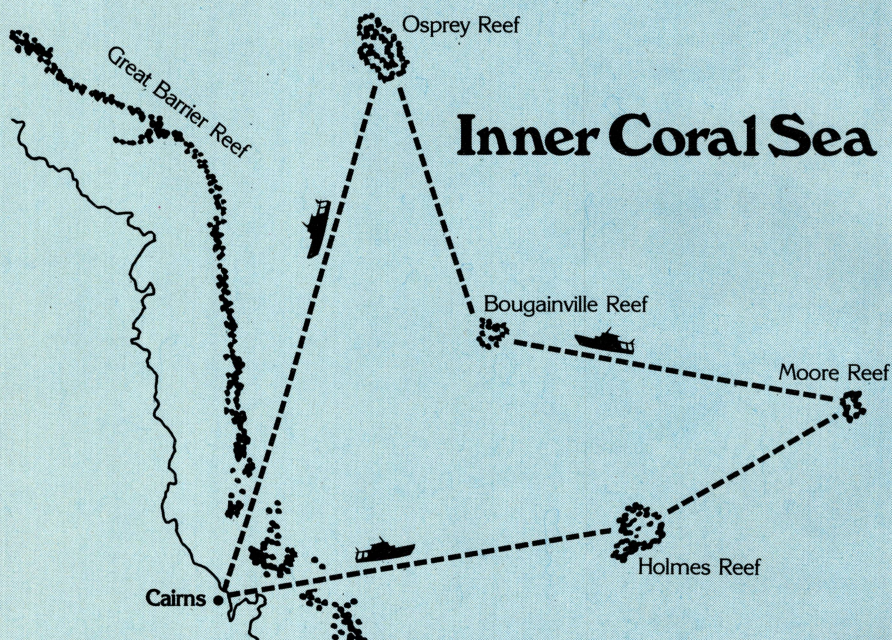
fast, unlimited air fills and a helpful hand with photographic equipment upon request. Divers can be in the water any hour of the day or night as long as the boat is at anchor, and numerous 110 and 220 volt outlets are available for charging strobes and dive lights if you desire to go at the unlimited pace.

During a normal ten day trip *Reef Explorer* will cruise almost 800 miles. Divers will visit Holmes, Moore, Bougainville and Osprey reefs as well as the Great Barrier Reef.

The best time to visit the Coral Sea, and the only time *Reef Explorer* runs trips, is from mid-May through mid-January. While I'm certain that every trip to this divers' fantasyland is a unique adventure, I'd like to share some of my experiences at some of the more commonly dived reefs.



Captain John Bound/*Reef Explorer*.



The route taken by the *Reef Explorer* during a ten day cruise through the inner Coral Sea.

Snorkeling off the stern platform.

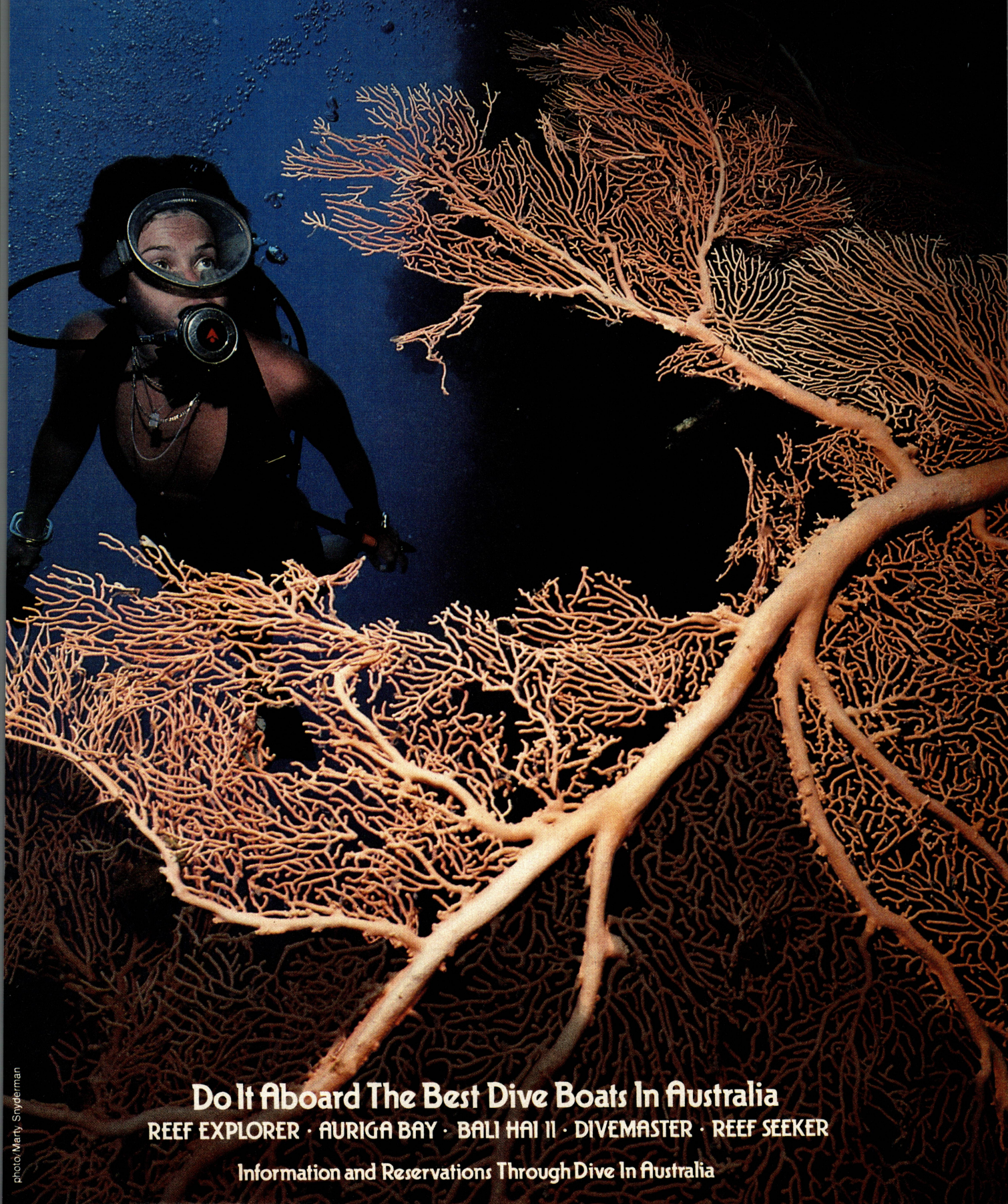


The 60 foot long, air conditioned *Reef Explorer*.





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## HOLMES

We departed Cairns late in the afternoon heading due east toward Holmes Reef. By early morning we were 125 miles off the coast, anchored at San Cay Reef. In the distance the sea was dark blue, but beneath the ship, the water changed from aquamarine, to green, to cobalt as we swung on the anchor.

I started my descent but stopped at ten feet, overwhelmed by the sight below. Visibility was easily 200 feet. Giant coral formations rose from deep water to within inches of the surface. In only a few feet of water at the top of the reef I saw numerous bright red and yellow crinoids. At 60 feet, I saw an anemone filled with several clownfish. I watched a school of jacks rapidly approaching from deeper waters and goldsmith flashed in the sunlight along the more prominent outcroppings. I spent the majority of my first dive observing clownfish as they attempted to lure me into a host anemone. Darting in and out of the tentacles, the clownfish danced in front of my mask only to suddenly seek cover in the anemone again. Nestled deep among the tentacles, the clownfish would turn and face me, wriggle excitedly, stop and wait for my response. The closer I approached, the more vigorous the swimming became, and if I backed off, the fish would dart out at me to begin the routine again.

On my next dive, I headed straight for the pass and found it to be filled with snapper, barracuda, and one large tuna. The walls in the cut were only 50 feet apart and covered with soft corals of every color imaginable. Behind the corals were speckled Coral Sea trout. Tidal currents provided an effort-free cruise through what we later named the Trout Valley Aquarium.

As we relaxed that evening we wondered why we should even move the boat at all. But the crew insisted that there are dive sites better than Holmes.

## MOORE

The third morning of our trip found us anchored along the southwest wall of Moore Reef, some 70 miles away. I had previously heard Valerie Taylor claim that, "Moore Reef has more of anything and everything than anyplace in the world."

The wall at Moore is as sheer and beautiful as a wall can be. Along the border of the lagoon the top of the wall comes within a foot or so of the surface, but take one seaward step and you'll literally plunge into the open ocean, suspended several thousand feet above the bottom. The first descent was breathtaking. The plummeting wall is covered with seafans and soft corals. Everywhere I looked the reef was teeming with fish. Only a few feet below the surface a maze of caverns began, cutting through the reef where large coral heads have grown close together. Trying to peer into every crevice, I found them filled with large

groupers, rays, Maori wrasse, and the entire gambit of reef fish.

Turning away from the wall I stopped, suspended in innerspace, and glanced into the blue to see a huge turtle surrounded by a school of swirling jacks. Continuing downward, my buddy and I found ourselves wedged between a ten foot high tree of black coral and a rich red soft coral that was nearly twice that size. At a depth of 150 feet we paused to look up and admire the towering silhouette of the wall.

Night diving at Moore was something we could not pass up. Going over the wall was a treat almost beyond description. Colorful crinoids were feeding everywhere. Butterflyfish, angelfish, tangs and parrotfish could be found asleep in the coral. Spotted morays were out seeking prey and I saw three slipper lobsters on a single coral head. Feeding coral polyps were extended everywhere but none of those sights compared to seeing a cave full of flashlight fish (*Photoblepharon*). Only recently discovered

Ralph Wheelli and Penny Bound admire giant yellow soft coral at Bougainville Reef.







An Australian lionfish (butterfly cod) at Holmes Reef.

in the Coral Sea, these small fish have large, luminescent organs beneath their eyes that glow. I turned off my light, and once my eyes adjusted to the darkness, I was able to maneuver through the cave, guided only by Nature's incredible show.

### BOUGAINVILLE

Our next stop found us anchored at Bougainville, 125 miles from Moore. On almost every dive at Bougainville, we discovered at least one cleaning station, with multi-colored wrasse busily at work grooming trout, cod and soldierfish.

There are a number of wrecks on Bougainville. One of the most interesting is an Italian freighter, the *Antonio Terabocchi*. In water between 20 and 60 feet deep, she is a virtual marine aquarium. The wreckage is secondary to the marine life even though artifacts are easy to find.

Night dives at Bougainville are real winners. Magnificent invertebrate life appeared in every crevice. Brightly colored shrimp, eyes glowing when struck by the beam of my light, were perfect photographic subjects. Feeding soft corals, their polyps extended into the current, jutted seaward from the wall. We

also found a group of brilliant red lionfish (butterfly cod) resting on a background of green sponges. Usually seen hiding in the reef during daylight, these nocturnal predators gave us a great opportunity to take close-ups.

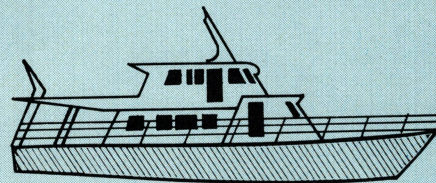
### OSPREY

Osprey Reef is the largest and most northern of the reefs in the inner Coral Sea. The oval shaped reef provides well over 50 miles of virgin dive sites and 300 foot visibility. Because of wind and tidal conditions we chose to anchor inside the lagoon and dive the wall via the tin boat. Simply put, those who dived the inside played with manta rays, those of us who ventured outside enjoyed gigantic soft corals.

Outside the wall, the water was crystal clear. It almost appeared as if we were suspended on a cushion of air rather than floating in water. Because the crew had never dived the area, we simply picked an interesting outcropping, dropped the hook, and in we went. Instantly, a dozen or more sharks appeared below. More curious than the others we had seen, they boldly swam within ten feet of us though

none showed any signs of aggression.

Had we been able to prolong our trip, all of us would have done so, I am sure. Had I been able to make just one more dive in the Coral Sea I am certain I would have seen something I had never seen before. Whether it would have been mating whale sharks, a nudibranch, or some indescribable crustacean, I have absolutely no idea. But I am absolutely certain that whether it is the large pelagics, the delicate invertebrates, the structure of a reef, or the chance to discover that strikes your fancy, you simply can't go wrong on a trip such as this one. A Coral Sea adventure provides a special opportunity. It is a place that once visited, the only logical thing to do is to return as soon and as often as possible.





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# The Outer Coral Sea

TEXT AND PHOTOGRAPHY  
BY CARL ROESSLER

**A** dive adventure at the oceanic reefs of the outer Coral Sea involves not only an immense geographic journey, but a journey of imagination as well. When the winds die away and our dive boats can reach these distant reefs, we find a unique kind of magic at work. With the sun blazing down on a shimmering

silken sea, and no sign of human activity for 50 miles around, we find that the magic all around us has touched us — become part of us.

Refreshed and recovered from our long journey across the Pacific we step aboard the spanking-clean *Reef Explorer* moored and waiting at Townsville. This 63 foot steel vessel boasts six air-conditioned double cabins, a homey saloon, and a stand-up bar where the most hair-raising dive stories are accepted without question. Our captain, John Bound, and his wife Penny run a tight but never up-tight ship. John, a fellow of bounding spirit and boundless energy, has a mischievous twinkle in his eye as he allows that, ah yes, he does have some new finds to share with us. With introductions accomplished and gear

stowed, we immediately depart. Our ultimate destination is fabled Marion Reef, 250 miles east-southeast, but along the way we have some other spectacular sites to visit.

## FLINDERS REEF

Named for Capt. Matthew Flinders, who stands astride Australia's maritime history, this 15 mile oval is an aquamarine gem in a cobalt sea. In the immense lagoon, sheltered from the ocean waves by the outer reef, the water is still. As we cruise in through the southern pass, there is no hint of the diving wonders all around us. The surface of the sea mirrors the vault of the sky, camouflaging Flinders' coral pinnacles. The sidescan sonar is not so easily fooled, and soon John Bound is telling the divers sunning on the

**An extreme close-up records the mysterious symbiosis between a feathery, yellow crinoid and a tiny clingfish at Flinders Reef.**





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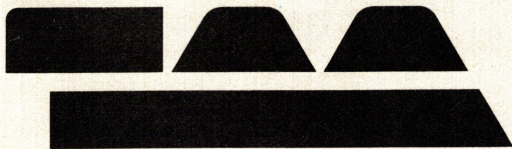
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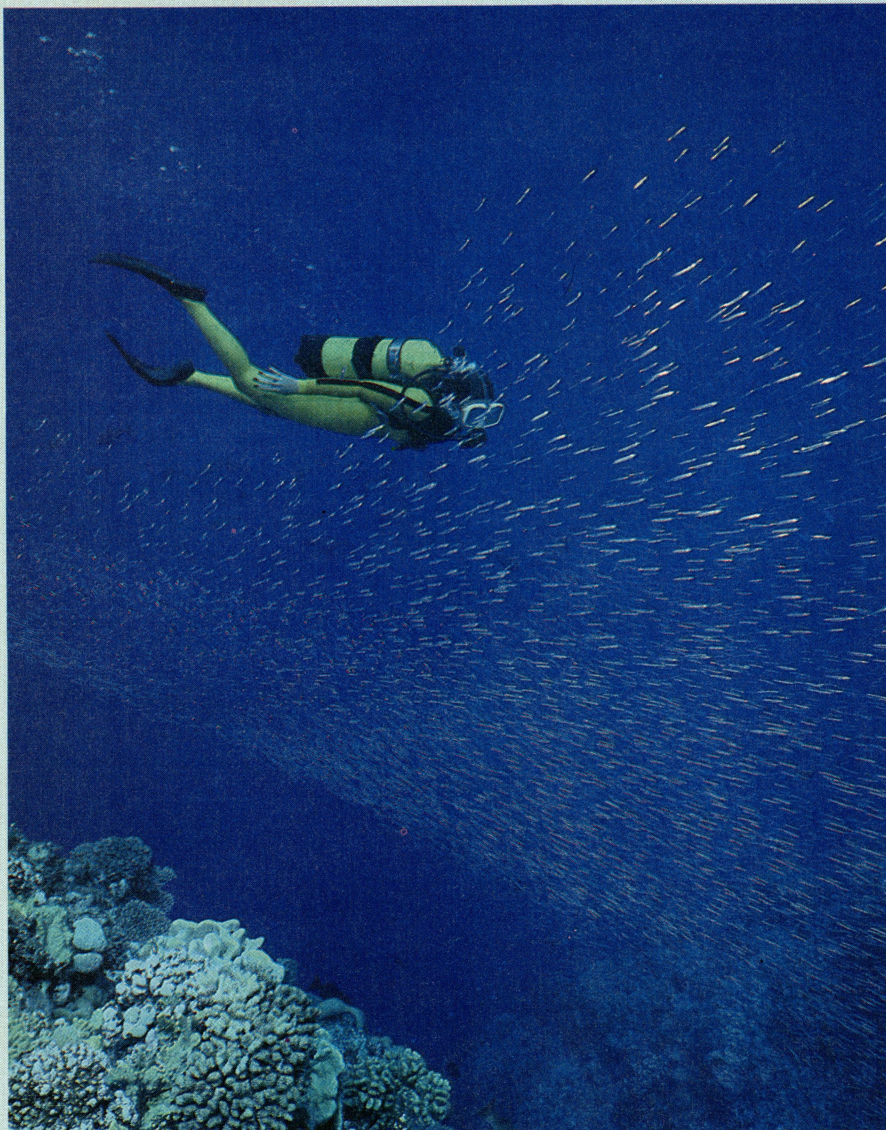
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That ability to go right back in is the great joy of live-aboard cruises. Avid divers/photographers want a format which enables them to maximize their diving opportunities; having your hotel room on the surface above you is the ultimate flexibility. Live-aboards tend to trade a slight loss of privacy for a great gain in number and quality of dives. We've found that an excellent trade-off, and the *Reef Explorer* a superb example.

### DIAMOND REEF

An overnight crossing from Flinders is Diamond Reef; the only part of the reef that reaches the surface is an island of perhaps two acres known as South Diamond Island. As the only land in thousands of miles of open sea, tiny Diamond is a crowded, cacophonous bird rookery. Its scrub brush is filled with masked boobies, red-footed boobies, terns, kingfishers and a variety of other species of sea birds. When our divers went ashore, however, they found another wonder altogether. In the shallows off the sandy beach a dozen huge sea turtles were mating!

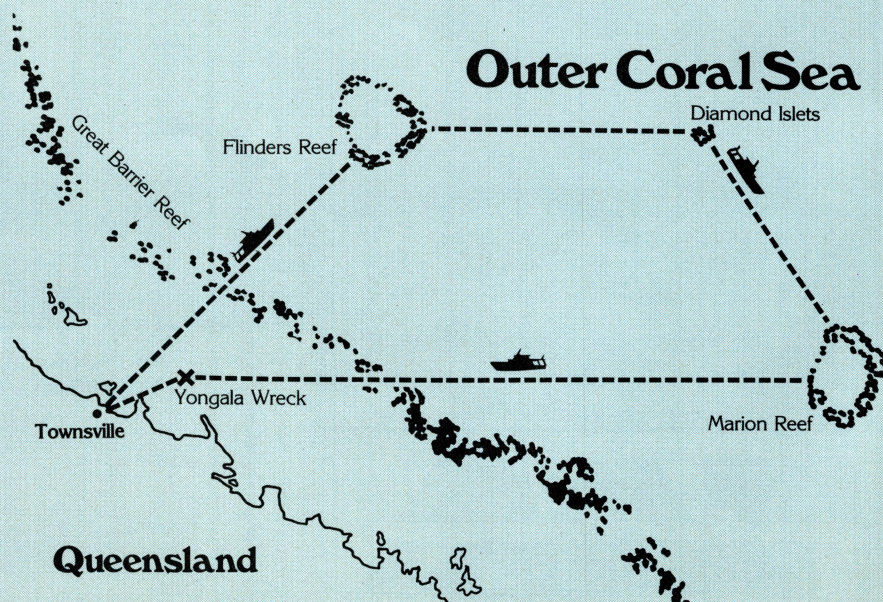
Off the beach at Diamond Island there is a mini-pinnacle which gathers marine life in an awesome way. The top of this structure is awash, and for some reason everything in the sea seems to pass by as you watch in awe. In a single day we had a flashing school of hundreds of goatfish and grunts, an eagle ray, a nurse shark sleeping under a ledge, several mating turtles, four big tuna — all at one coral head at a depth of perhaps 30 feet. This type of diving is the unique signature of these outer Coral Sea reefs.

forward deck, "Pinnacle dead ahead!"

Sure enough, the blue of the deep lagoon water suddenly gives way to a shimmering green-gold. Looking down from the deck through the brilliantly clear water we see a gigantic coral city rising from the depths to within ten feet of the surface. The intricate surface of the immense coral mass is a tapestry of golden plate corals, which heighten an already stunning visual effect. Shadowed valleys carve through the coral mass, creating caverns and ledges which attract the light-shy spectrum of reef dwellers normally seen at night.

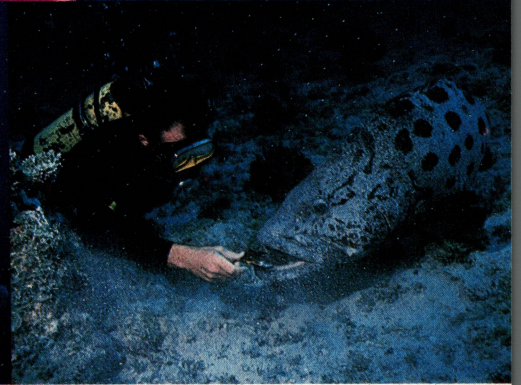
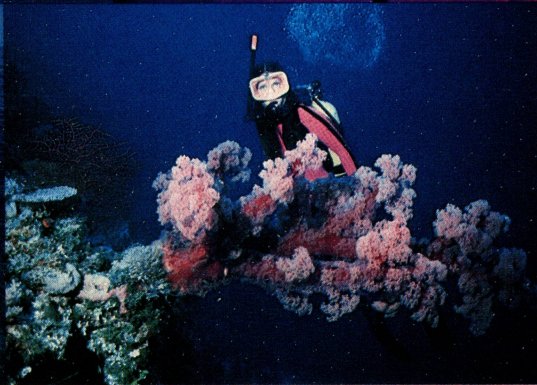
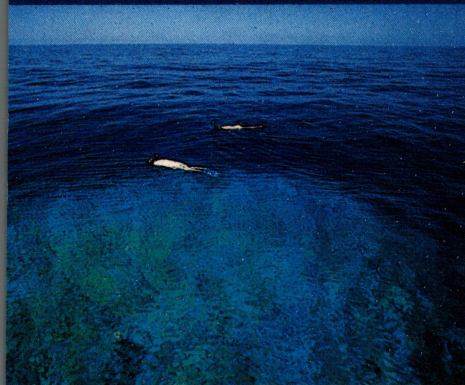
In the course of two days at Flinders we dive several different pinnacles. One of my favorites is the so-called Jinx Bommie (Bommie being an Aussie term for a coral head which doesn't reach the surface). This not-so-affectionate nickname derives from our first dive there, when seven of eight cameras that entered the water malfunctioned. What subjects we missed! Huge soft corals, shadowy tunnels, a sheer vertical wall in crystal water, eels and jacks.

**Above: Jessica Roessler cruises off the outside wall at Marion Reef. Below: a chart of the outer Coral Sea traces the route of the *Reef Explorer* from the port of Townsville.**





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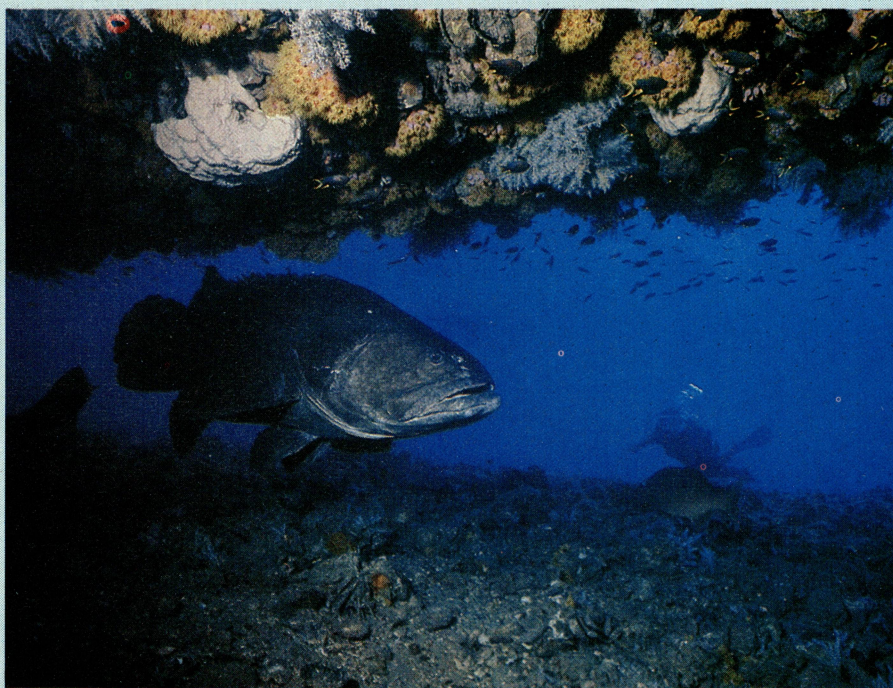


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Schools of fish cascade down the steep sides of a coral pinnacle at Diamond Reef.



A huge grouper cruises under the wreckage of the *Yongala*. Other large animals found around this wreck include stingrays, jacks, barracuda, sea snakes and a pod of pilot whales.

## MARION REEF

Marion is the southernmost of the great oceanic reefs of the Coral Sea. It is the only one which extends into the range of the fascinating sea snakes; we find six species at Marion, but none at Diamond, Flinders or other reefs to the north.

We come upon the snakes (we call them "snikes" when we are kidding our Australian friends) in brilliant clear water at all depths. Since they hunt small fish in crevices by night, they spend the daylight hours napping right out in the open. Sometimes two or three will lie down together, their sinuous bodies intertwined.

Since the snakes are air breathers they go to the surface every hour or so. During these excursions the curious snakes will spot our bubbles and swim by to look us over. Their fearsome reputation, like that of barracudas, is quite simply overstated and undeserved. I know of no incidents in which they have bothered divers. On the contrary, they seem to find us hugely entertaining. They will flick their tiny forked tongues on your faceplate, your hand, your camera and your flipper. They really love to swim between your feet and be tumbled by the turbulence.



Marion's pinnacle cities (there are upwards of 50 in the 15 mile long lagoon) are mighty classics. Rising from water some 200 feet deep, they crest just ten feet short of reaching the surface. Some are spires, rising dramatically from the depths; others are extensive complexes of ten or more spires on broad plateaus.

In the sandy valleys between the spires we'll often find sizable groupers or sleeping nurse sharks. On one occasion we surprised a pair of ten foot nurse sharks and surrounded them with photographers. Thus pestered, the big sharks rose reluctantly from their comfortable perch and soared off.

Besides the obvious wide-angle subjects I've described there are sheltered valleys filled with pink hydrocoral and lush soft corals, there are huge anemones with saucy clownfish, there are hundreds of species of stony corals decorating the skin-surface of the massive coral pinnacles.

In the waters above the coral structures, dance and flash an awesome array of tropical reef fish. There are 92 species of damselfish alone in Australian waters, dozens of butterflyfish, great swarms of silver anchovy, stately batfish, the incredibly colorful grouper the Australians call the Chinese footballer trout. On the shallow reef-tops we regularly find octopus, right out in the open, but with a leg or two in their protective shelters. This unchallenged master of disguise offers our divers a rare treat — it seems no two pictures are alike, even when they are of the same individual.

After several days and dozens of dives we are pulled, kicking and screaming, from the water to begin the journey home. I'm happy to say that even on the last day we have one more extravaganza for you. The *Reef Explorer's* home port is Cairns, but she moves south to Townsville for the series of Marion Reef cruises. By a happy accident, our route into Townsville passes over the sensational wreck of the S.S. *Yongala*. There were several 200 pound groupers, huge sting-rays, hundreds of jacks and barracuda, sea snakes, a parade of stately batfish, even a pod of pilot whales.

Because she lies in the middle of miles of empty sand bottom, the *Yongala* has gathered life like an African water hole; indeed many of the same kinds of truce between predator and prey can be observed here. It is one of the most awesome assemblages of marine life I have ever witnessed, and I am delighted our Marion Reef cruises bring us within range of this most amazing bonus dive.

Our journey of geography and imagination finally ends after 16 days of varied thrills. When I sit quietly at home, imagination stirs and wonderful memories return. The endless crystal waters, the wonderful meals aboard the *Reef Explorer*, the intense yellow-green of the sunlit pinnacles against the deep blue of the lagoon. Echoes, echoes. . .

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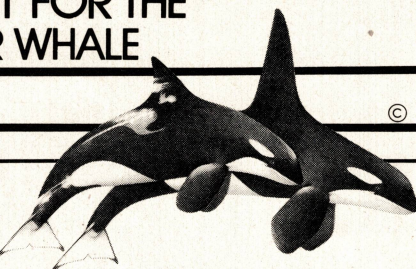
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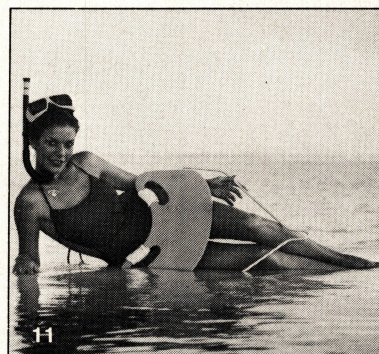
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### NEW GEAR

(Continued from Page 16)



10



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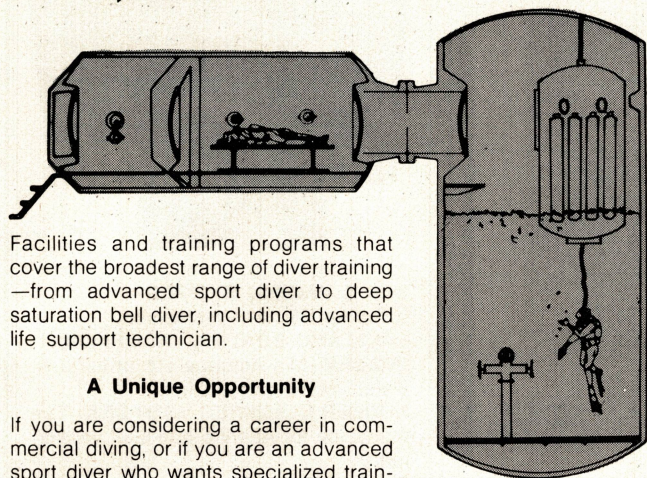
**9 Record Album**—Popular throughout the Cayman Islands and well known for their Scuba Do music, Barefoot Man and his Band have released their second album with a diving theme, **Scuba-Do-2**. Humorous and full of island flavor. \$8.50. For information contact Barefoot Records, Box 1249, Grand Cayman, BWI.

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Development of underwater industry in the past decade has created a great demand for the professional diver. A wide range of skills are required for career advancement beyond entry level positions, and to maintain professional diving standards required in international waters.

The program at the North American Hyperbaric Center offers you, the advanced diver, the skills you need to improve your professional status. You will be exposed to current technological developments in the underwater industry which will allow you to work world-wide as a mixed gas bell diver; to serve topside as a life support technician, and will qualify you for trainee supervisory positions with commercial contractors.

The average commercial diver makes air dives in relatively shallow water. Employers are looking for mixed gas bell divers who have had exposure to 400 feet or more. You can satisfy your future employer's requirements by training at the North American Hyperbaric Center.

Divers train here in hyperbaric chambers used by the United States Navy Experimental Diving Unit to develop decompression tables and train first class and master divers.

To be competitive today, a professional bell diver must have a thorough working knowledge of the systems and procedures which support him from the surface as well as underwater training. Emphasis is given to advanced training as a topside life support technician. Classrooms, laboratories and a medical clinic are settings for instruction in advanced gas mixing, analysis, and emergency medical management.

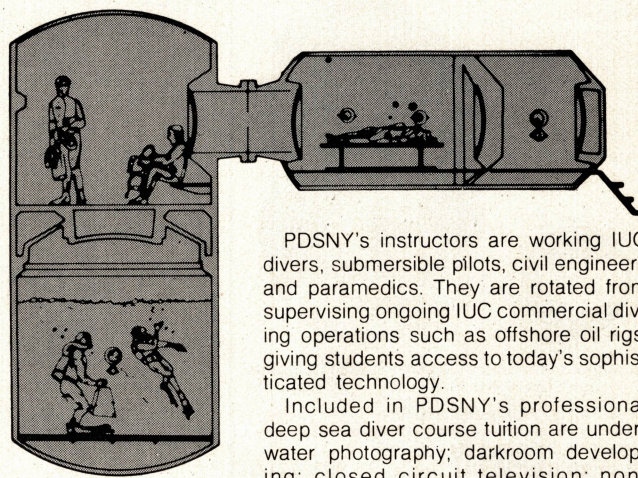
Professional training at the North American Hyperbaric Center will give you the experience you need in the field, with exposure that duplicates your future job. Saturation dives to 400 feet and topside workshifts are an integral part of the program.

At the present time, 80% of PDSNY's graduate divers are employed by IUC or IUC International, Inc., and are involved in offshore oil exploration and production, marine inspections, salvage, and submersible operations in Indonesia, the North Sea, the Mediterranean, the Gulf of Mexico, and off the coast of West Africa.

With complete advanced training at the North American Hyperbaric Center, you will have increased your career potential.

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Over 15,000 square feet of classrooms, diving tanks, shops and floating barges comprise the school's facilities on IUC and PDSNY's 7.5 acres at the water's edge on City Island in New York City. Access to Long Island Sound provides student divers with field conditions to sharpen their skills.



PDSNY's instructors are working IUC divers, submersible pilots, civil engineers and paramedics. They are rotated from supervising ongoing IUC commercial diving operations such as offshore oil rigs, giving students access to today's sophisticated technology.

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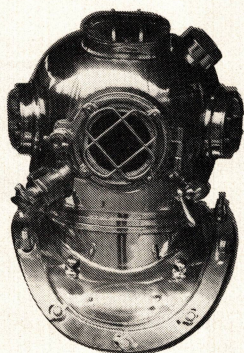
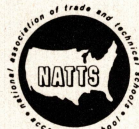
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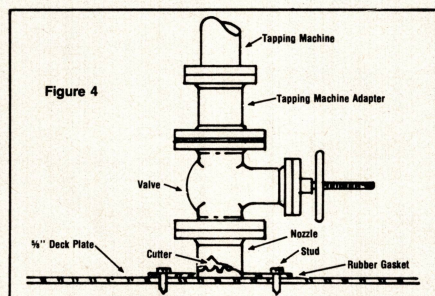
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## TECHNIFACTS

(Continued from Page 30)

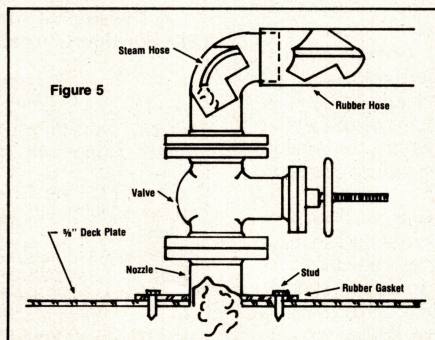
20 inch diameter five-eighth inch thick steel plate. An eight inch 150 pound rating flange was welded to the top of the pipes.

A rubber gasket is placed between the deck or hull and the nozzle plate to help make an oil-tight seal. Divers can then rivet the assembly to the hull as



shown in Figure 4. The valve is bolted to the flange and the hot tap machine adapter is bolted to the valve. Finally, the tapping machine is lowered in place and bolted to the adapter.

When the machine is in place and bolted securely, the valve is opened and the hot tap tool (cutter) is run down into the nozzle until it touches the deck of the vessel. The machine is then operated by the diver, and the cut made automatically or manually. Approximately one hour will be required for each cut through a three-eighths inch plate. Figure



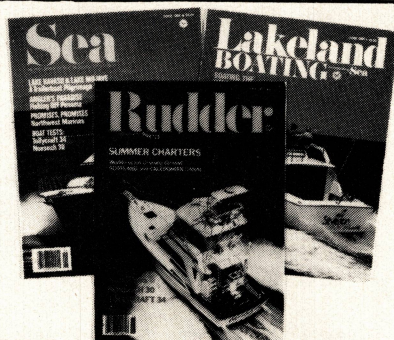
6 shows a scuba diver operating the model 660 hot tap machine on a tanker hull in about 100 feet of water.

After the cut is completely through the hull, the hot tap tool is retracted from the nozzle and the valve. The valve is then closed and the hot tap machine can be removed to continue additional cuts through other nozzle assemblies on other tanks.

To prevent attaching and cutting through the hull directly over reinforcement webbing or a compartment bulkhead welded to the underside of the deck plating, divers should sound the deck by tapping it with a hammer. A

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more hollow sound will be heard if there is no reinforcing metal beneath the deck plating.

After the nozzle and valve have been installed and the hot tap completed, a short length of rubber hose of appropriate size can be attached with a 90 degree elbow, run along the deck and then directly up to the recovery barge on the surface. A steam nozzle can be installed on the hose as shown in Figure 5

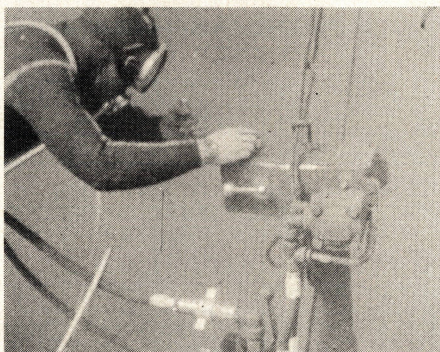


Figure 6

to raise the temperature of the oil and make pumping easier and faster.

Another method of raising temperature — and also to help float the oil up to the hot tapped fittings — is to install additional small diameter hot taps as near the bottom of a tank or compartment as possible. Steam, or very hot water can be pumped in through these taps.

In 1976-1977 CIE Maritime D'Expertise (Comex) of France salvaged 2500 tons of crude oil from a tanker that sank in 360 feet of water. Comex used a combination injection-extraction system through a junction box in the hull of the vessel. The very heavy crude in the sunken tanker was heated by pumping hot, high pressure sea water through the ship's tanks as they were being emptied. Two hundred sixty-one bell dives, with three men aboard each, were made, totaling 1146 man-days and 548 man-hours of bottom time. The operation took ten months.

In late 1978, Oceaneering International, Inc., successfully salvaged the oil from the fuel tanks of the drill ship *Topper III*. The salvage team worked from another drill ship, the first known such use, and salvaged the oil by a hot tap method similar to that described.

For information on velocity power tools see the following: 1) *Handbook of Ocean and Underwater Engineering*, McGraw Hill Book Co., N.Y. 2) *U.S. Navy Diving Manual*, 1943. This book is long out of print but copies may be found in a library. 3) *Deep Diving and Submarine Operations*, Davis; St. Catherine's Press, London. This publication discusses the Cox velocity power tools, the British counterpart of U.S. power tools.

M and E Marine Supply Co., Box 601, Camden, NJ 08101 stocks the Ramset power driver. Their catalog also illus-

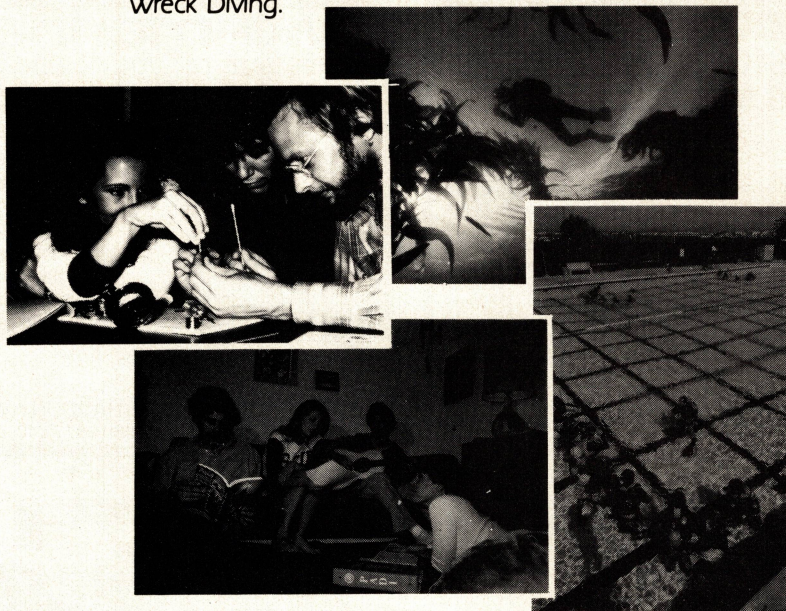
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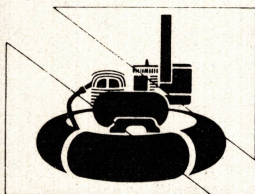
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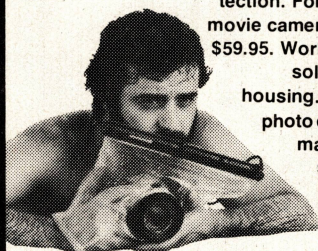


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## TECHNIFACTS

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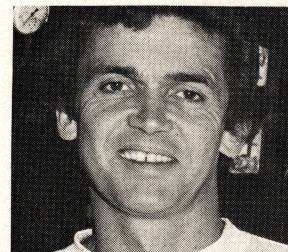
## TECHNIBRIEFS

The first man in Hawaii to use commercial dive equipment did so in 1840. According to a recent article in the Honolulu Star-Bulletin and Advertiser, the diver, a man named Dibble, wore a rubber mask and used a glass helmet. While underwater he noted the hull of the brig, *Porpoise*, was badly fouled and was engaged to clean it. This was also the first U/W hull cleaning job in Hawaii.

For the third consecutive time the U.S. Navy has signed a contract with Oceaneering International, Inc., Houston, Texas to provide a variety of underwater emergency repair capabilities. Particular emphasis is placed on Oceaneering's hyperbaric welding capabilities. Between 1977 and 1979, Oceaneering underwater welders made 25 structural repairs on 20 different Navy destroyers. The contract also specified the company to remain on continuous, 24 hour a day call-out and be able to provide these services on a worldwide basis.

## DIVER MEDIC GRADUATES

Commercial Diving Center has graduated 179 Diver Medic Technicians from 13 classes since 1975. Richard E. Clarke, a saturation diving supervisor for Oceaneering International, Inc., teaches the practical diving portion of the course. A British subject, Clarke has been



**Richard Clarke**

training medical diving personnel and been involved in research programs with emphasis on the medical aspects of saturation work for over ten years. The purely medical phase of the course is conducted at the emergency medical care and paramedic training department of the Daniel Freeman Hospital, Hawthorne, CA.

CDC's particular Diver Medic course meets the requirements of the Undersea Medical Society, the National Registry of Emergency Medical Technicians, and the U.S. Coast Guard.

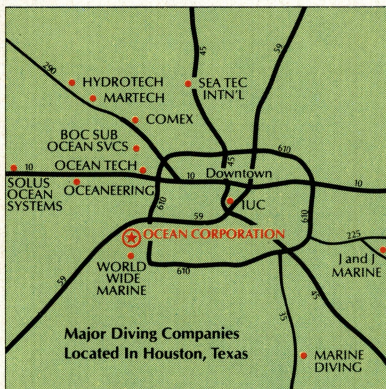
For full information about the diver medic course, contact Mavis A. Hill, Admissions Office, at CDC, 272 South Fries Ave., Wilmington, CA 90744.



# Why Houston?

## BECAUSE

The Ocean Corporation is located in Houston and more commercial divers are hired in Houston than in any other place in the world. Twelve diving companies are located in Houston including three of the four largest in the U.S. Many others are located in the nearby New Orleans area. The demand for divers is so great in Houston that large locally based diving companies like Ocean Systems, Hydrotech Systems, Martech International and Sea Tech International have hired many of our students for part-time work while they were attending school. Over 90% of our recent graduates went to work for these and other local diving companies when they completed our program. Houston is the place where the action is... the commercial diving, offshore construction and oil industry capital of the world.



## BECAUSE

The Ocean Corporation is a commercial diving company, not just a school. Our facilities, equipment and training aids are the best, and our diving systems are as up-to-date as possible... because much of the equipment is used by our diving operations division to perform actual diving contracts in the field. Ocean Corporation has successfully completed many underwater jobs for various industrial clients over the years... including specialized underwater inspections, maintenance and repair work. For example, we did the world's first commercial underwater repair job in a nuclear power plant. And most of our divers have been graduates of our own school.

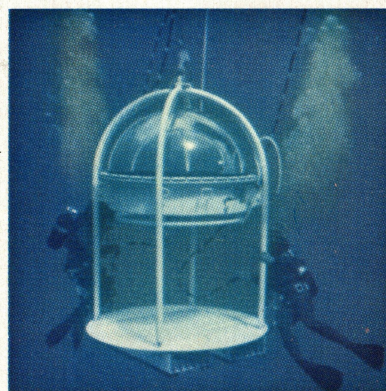
## BECAUSE

The Ocean Corporation is a convenient and exciting place to go to school. Houston is one of the fastest-growing and most dynamic cities anywhere. It is a city of expansion, energy and youth (the average resident's age is in the mid-20's). Houston offers every conceivable kind of entertainment, from sports events, ultra-modern discos and open-air theater to rough-house local rodeos, chili cook-offs and the new Texas-size country-western dance clubs. Reasonably priced adult and singles apartments are readily available within walking distance of the school, and fast-food to luxury restaurants are nearby. The semi-tropical climate is wonderful, the sport diving is great and the folks are friendly.



## BECAUSE

The Ocean Corporation management and instructor staff have long-term experience in the international offshore oilfield diving business. Retired ex-military divers and sport scuba divers don't run the school... commercial divers do. For example, the President of The Ocean Corporation, Larry



Cushman, was Vice President and Europe/Africa Area Manager for Ocean Systems, Inc. for three years... with responsibility for all North Sea diving and underwater construction operations. He also worked six years as a manager for Oceaneering International, Inc., another of the world's largest commercial diving contractors. Ocean Corporation managers and instructors know today's diving business... first-hand, from recent experience.



### The Ocean Corporation

5709 Glenmont • Houston, Texas 77081

If you are interested in becoming a commercial diver, please write and ask for our free information package on job opportunities, our school and our super city. If you'd rather call, make it collect and ask for Fred Tourtel (713) 661-0033.



School of  
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Industrial Diving

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# FUJICHROME 100



In tests using Fujichrome 100, Jim and Cathy Church found that colors came out warm and bright — especially yellows, greens and bluewater backgrounds. Cathy encountered the octopus off Lanai and the lemon butterflyfish off Molokini in the Hawaiian Islands.





# WHAT CAN IT DO FOR YOU?

TEXT AND PHOTOGRAPHY BY JIM & CATHY CHURCH

Let's assume that you shoot color slides and want to simplify your film choice. Rather than buying two or three different types, you wish to standardize with one for all subjects. If so, Fujichrome 100 may be the general purpose film you need.

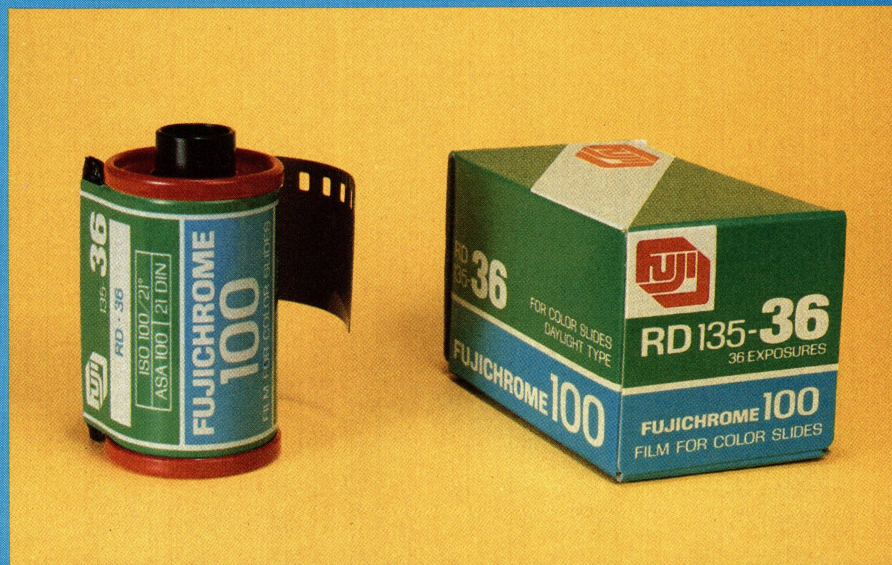
You can use Fujichrome 100 topside and underwater for both close-ups and scenics. And, once you have your exposure meter set for ASA 100, and have worked out your strobe exposures, you don't have the bother of making (or forgetting to make) changes. If you've ever forgotten to change the ASA on an exposure meter, or couldn't remember what kind of film was in your camera, you know the advantage of standardization.

If you've never used Fujichrome 100, your first question will probably be, "How do the colors look?" And, based on our test exposures, the colors are definitely warm and bright — especially yellow and green. Bluewater backgrounds were also excellent. Skin tones tended to be slightly yellowish and helped brighten the pictures. And, in previous test exposures, when the water had a greenish tint, the background was a rich green. Most colors seemed as saturated and as snappy as those produced by Ektachrome 64.

Fujichrome 100 is best at camera-to-subject distances of about two apparent feet or more. Because you can close the aperture two-thirds of a stop more than with ASA 64 color slide films, depth of field is increased. This increase is more important if you are using a 35 mm lens with a 35 mm camera such as the Cosina, Formaplex, Nikonos or Ricoh, because 35 mm lenses have limited depth of field at wide apertures and close distances.

This additional depth of field can make or break a picture if it includes both far and near subjects. For example, if a diver is looking at a fish that is between the diver and your camera, the picture will be better if both the diver and fish are sharp. The additional depth of field also helps cover your focusing errors. And, in dark conditions, ASA 100 may allow you to take pictures that you couldn't take with a slower film.

We also took close-ups on Fujichrome 100 with a Nikon F and 55 mm Micro-Nikkor lens, and with a Nikonos with both a 15 mm lens and a 35 mm lens with a 1:2 extension tube. The results were reasonably good. Of course, a slower speed film with finer grain and increased



Available in 20 and 36 exposure cassettes, or 120, 12 exposure rolls, Fujichrome 100 can be developed with Fujichrome process CR-56 by photo labs or, using the E-6 process, at home.

sharpness would be better for close-ups. When making color prints of close-ups from Fujichrome 100 color slides, go for 8 x 10 or 11 x 14 rather than 16 x 20 inch prints where grain becomes more apparent. The finer the details of your close-up subjects, the more noticeable grain becomes.

Topside shots with Fujichrome 100 are also bright and colorful. Yellows and greens are rich, blues are good, with skin tones slightly yellowish.

To sum up, Fujichrome 100 straddles the fence between ASA 64 and ASA 200 color slide films. The ASA 64 films have finer grain and Kodachromes produce sharper close-ups; ASA 200 films are one stop faster which increases depth of field, but faster films have more grain. Thus, Fujichrome 100 is a compromise; it is a good choice for those who wish to combine close-ups and normal or wide-angle shots on one roll of film.

Although combining close-ups and long shots on one roll of film is not an ideal way to take pictures, there may be times when this is necessary. For example, you may want to load film into your camera in your hotel room before you have any idea where the boat is going for the dive. You may not know until you are actually in the water whether the dive site is best suited for close-ups or long shots. With cameras with add-on close-up or wide-angle adapters, you can decide in the water what type of photos you want to take. In these cases Fuji-

chrome 100 would be handy.

We are eager to try Fujichrome 100 in the Virgin Islands, especially at the wreck of the *Rhone*, where some sections are a little deep and dark for ASA 64 films. Because of the vivid red sponges, yellow cup corals and other colorful sea life found on the *Rhone*, we expect that this film will produce exceptional colors.

Fujichrome 100 may also be a good film for special lighting techniques such as filtered flash, where the colored filters can reduce light intensity too much for use with ASA 64 films.

Fujichrome 100 is available in 20 and 36 exposure cassettes (and 120, 12 exposure rolls), with or without prepaid mailers. The exposed film can be mailed directly to a Fuji lab for processing, or can be sent to other (non Kodak) labs using Fujichrome process CR-56, or the E-6 process. Because most color slide processing at remote locations is E-6, you can have your Fujichrome slides processed by these facilities. And, if you process your own slides, Fujichrome can be processed at home with E-6 kits.

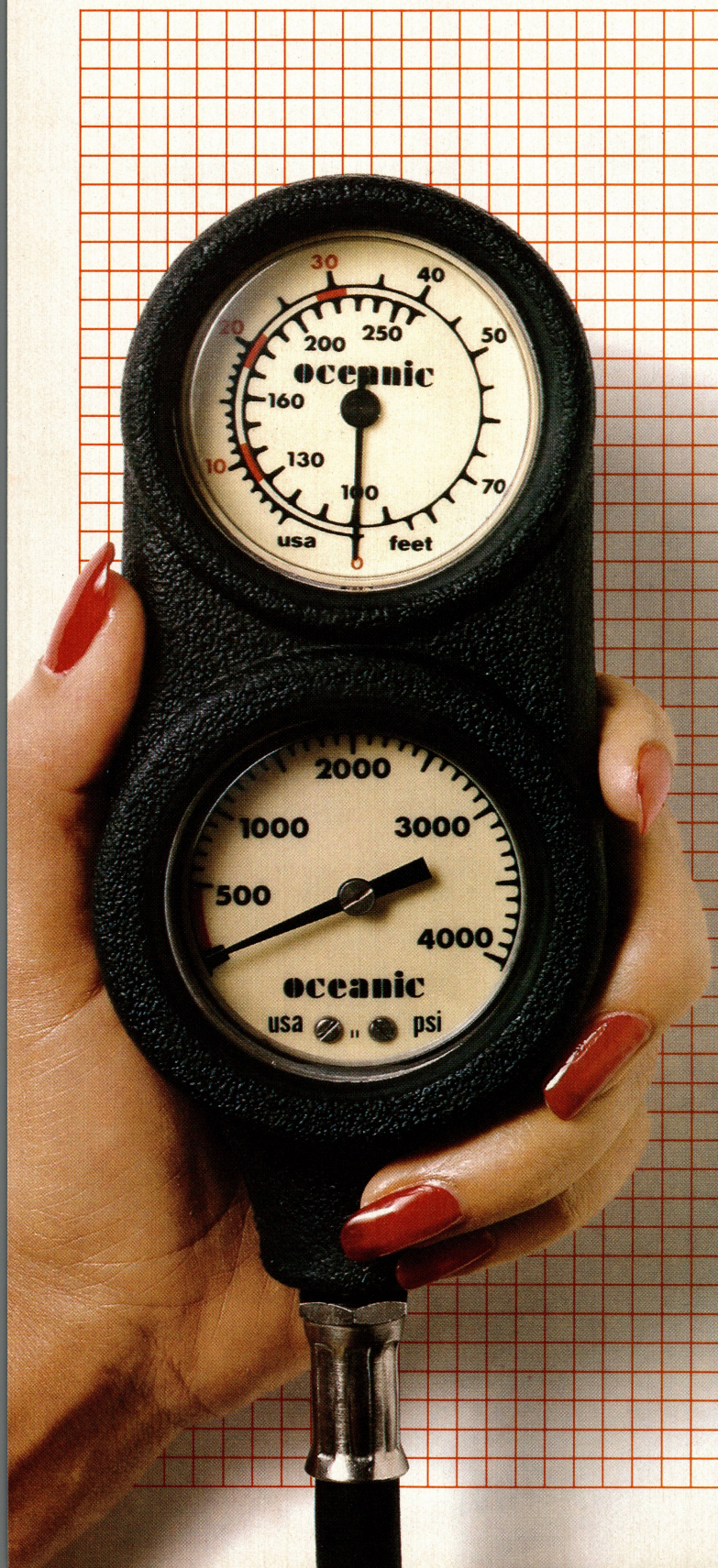
The Fujichrome canisters (in which the cassettes are packaged) are transparent. Thus, you can tell at a glance if the film has been used and what kind it is.

In addition to ASA 100, ASA 400 and other films are available from Fuji. For more information, contact your local photo center, or write directly to: Fuji Photo Film Co. Ltd., 350 Fifth Avenue, New York, NY 10001.



# 1 DIVER UPDATE helical\* precision gauges

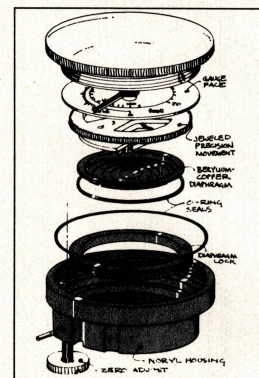
**Oceanic**



## WORTH LOOKING INTO...

Almost every diving gauge in the world today contains a rubber/plastic diaphragm and is filled with oil. Traditionally these two primary system components have presented problems of temperature stability and reliability.

By using an environmentally proven beryllium-copper alloy diaphragm enclosed in a Noryl plastic housing Oceanic has eliminated oil filling and the major cause of gauge failure.



Because these new gauges are designed from the inside out, we also replaced the traditional "C-spring" Bourdon tube with a jeweled precision movement from Europe. Like a Swiss watch or a German car, this movement is precise, smooth, and designed to last. Oceanic gauges are the ideal marriage of European craftsmanship and American technology.

## 'hel-i-kæl

Similar to spiral. The gauge face display permits the pointer to move way beyond the traditional 270° sweep. By using a more linear pressure transducer and more accurate movement, we expanded the display pointer sweep to 440° or 1½ revolutions. So what? The individual data points on the gauge face are further apart, insuring easier reading, faster understanding, and no guesswork. Guessing your depth is no longer part of the thrill of diving.

## WHAT YOU SEE IS WHAT YOU'VE GOT = DEPENDABILITY

Traditionally we all dive down, tap our gauges, compare our depth readings, and hope the truth is somewhere in between. No more. Your Oceanic gauge will be the one that's right. That's dependable.

## untouchadjustable™

You don't recalibrate the zero just for fun. You may want to adjust your gauge for non sea level diving, perhaps following high altitude transport, or following a few hard knocks. But not by accident. Certainly not without knowing. To adjust a new untouchadjustable gauge just pop a screwdriver or coin into the recessed slot. Adjust. Go. You dive confident it won't be adjusted again without your knowledge. And when the dive is over you can expect the pointer to be right back on the zero. Not because of a zero pin (there isn't one) but because these gauges are accurate. Period.

## SLIM, TOO

By designing from the inside out and using only premium materials, you enjoy the added benefit of a gauge system that is not only much lighter but more importantly it's thinner, easier to grasp, and has reduced hydrodynamic drag. The boot design includes a raised rubber gauge face ring with proven ability to protect your investment.

Add confidence and accuracy to your next dive with a handful of Oceanic gauges. It's quite a combo.

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## HABITAT PHOTOGRAPHY

An expanded underwater photography program has been established at Captain Don's Habitat in Bonaire. Private and small class instruction for both beginners as well as experienced U/W photographers is being offered by Mike Morgan, PADI master instructor. Mike joins the Habitat instructional staff after several years teaching U/W photography in the Virgin Islands.

Newly refurbished and expanded dark room facilities offer not only the usual slide processing but also overnight custom color printing services. Mike will also have strobes and Nikonos cameras for rent and facilities for on-the-spot repair of some common camera problems.

For information or reservations call Frank Fennell at (802) 496-5067; or write P.O. Box 237, Waitsfield, VT 05673.

## COMMERCIAL DIVER EMPLOYMENT UP

The demand for trained commercial divers is increasing as the offshore oil and gas industry continues to experience rapid expansion. Jim Joiner, executive director, Commercial Diving Center, cites as an example the eight students who were recently hired prior to graduation by the Khalifa A. Algosaibi Diving Service in Saudi Arabia. This company (for which Commercial Diving Center is a U.S. agent) operates eight dive vessels in the Arabian Gulf and plans to double its staff of 100 divers over the next three years.

Divers who are interested in investigating commercial opportunities should contact Commercial Diving Center, 272 S. Fries Avenue, Wilmington, CA 90744; or call collect (213) 834-2501.

## STONEMAN FILMS

John Stoneman has completed work on his most recent documentary. *Mythical Monsters of the Deep* is scheduled for network airing later in the year. It sets out to dispel many of the myths that have built up around the creatures of the sea.

Work also continues on a one hour television special about the great whales, entitled *The Gentle Giants*. This documentary is being shot on locations all over the world and includes footage of humpback, sperm, beluga, right, narwal, finback, minke and bowhead whales as well as orcas.

An environmental work entitled *Survive!* was completed in March. This film is a plea for the many animals faced with extinction.

Questions regarding these films and the John Stoneman Show should be addressed to: Mako Films Ltd., 25 St. Mary Street, #101, Toronto, Ontario, Canada M4Y 1R3; telephone (416) 960-3228.



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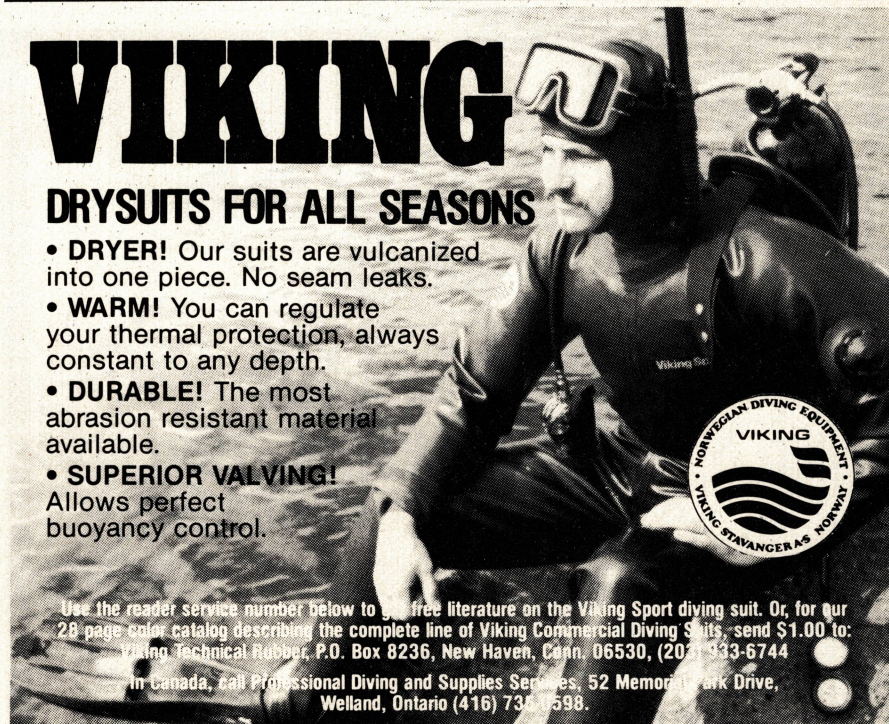
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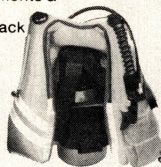
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## DIVERS' DAY

Marine World-Africa USA in Redwood City, CA will host the Central California Council of Diving Clubs' Fifth Annual Divers' Day on Saturday, September 11. The program will include scuba skills demonstrations, manufacturer display booths, wacky water races, raffles, travel information, safety demonstrations, and the Marine World shows and exhibits.

For ticket information contact Cen-Cal, P.O. Box 779, Daly City, CA 94017.

## SUNSET HOUSE FACILITIES

Sunset Divers has been completely renovated and has acquired two new 36 foot dive boats, custom made to specifications.

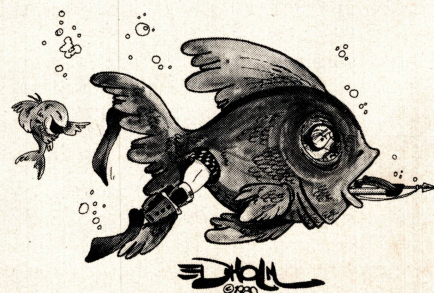
Sunset Divers offers a total of 250 72 and 80 cubic foot aluminum tanks, all recently visually inspected. The dive shop's Rix water-cooled 4000 psi oilless air compressor and storage system can produce and store 40,000 cubic feet of air at 4000 psi — the largest air storage unit in the Cayman Islands.

## RESORT COURSE

PADI International has sanctioned the resort specialist/divemaster course offered by Divers Unlimited/Underwater Careers International. This nine day, 85 hour program includes PADI divemaster training, three PADI specialty certifications, first aid and CPR, and certification as a factory authorized repair technician. By special arrangement two additional PADI specialty classes may be scheduled thereby enabling the diver to earn PADI master scuba diver rating.

Resort specialist graduates who meet other prerequisites may qualify to attend the PADI instructor training course held at the conclusion of each resort specialist program. In addition, UCI provides employment referral and job placement to all qualified graduates.

For more information about this program contact Alex Brylske, Program Director, Divers Unlimited/Underwater Careers International, 6023 Hollywood Blvd., Ft. Lauderdale/Hollywood, FL 33024; (305)981-0156.

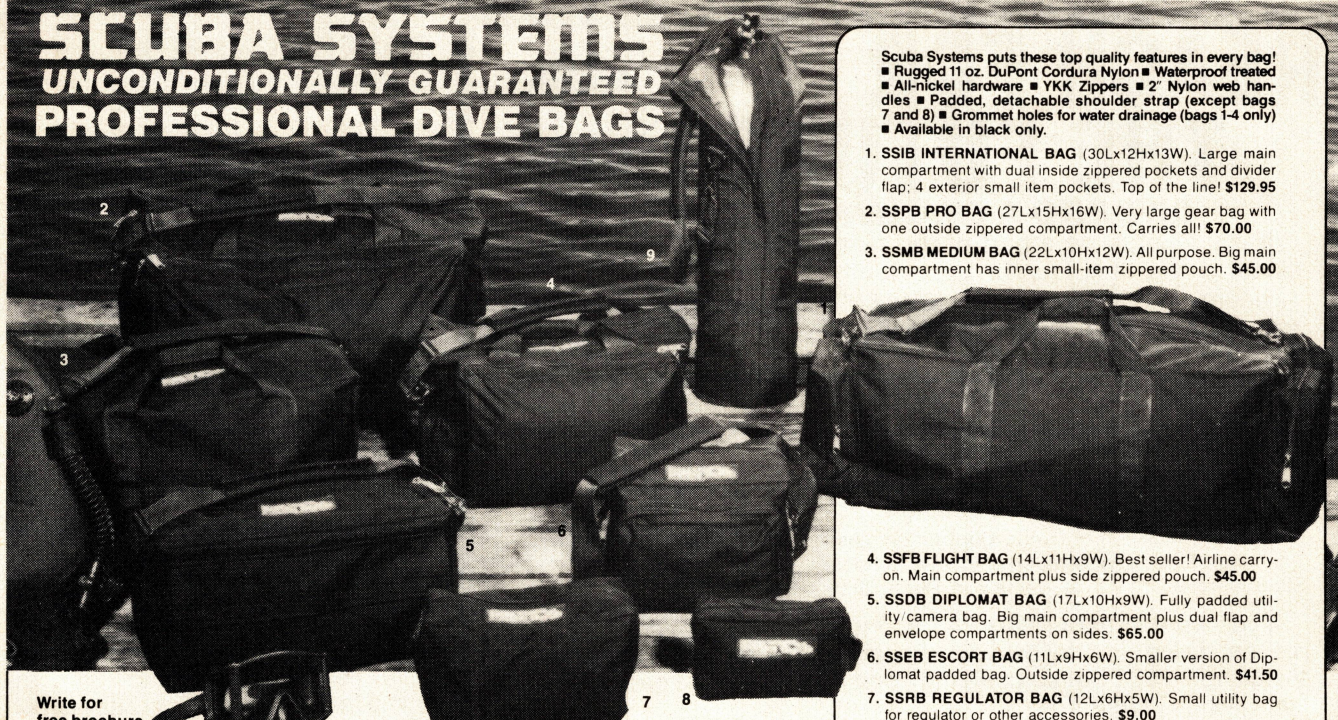




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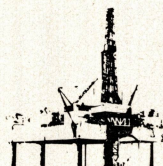
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## BAUER COMPRESSORS

(Continued from Page 32)

point. The compressors are tested at many points during assembly, but the most rigorous testing is saved for the completed product. Only after the compressors have passed this are they shipped to their final destinations.

Compressors come in all shapes and sizes. From small, lightweight units that can be carried by one diver, to large industrial units that can easily be handled by one large truck. What's the difference between your average portable sport diving compressor and the larger models found in a dive shop? In terms of the quality of air, none. In terms of quantity of air and cost, quite a bit. Compressors are rated in terms of their ability to pump air measured in cubic feet per minute (cfm). Generally speaking, units that pump from 2-5 cfm are considered portable units, while models that pump 7-51 cfm usually need to be permanently installed. Dive stores usually employ compressors in the middle range of this scale (7-17 cfm). The models in the upper range (24-51) are used in commercial and naval deep diving, where a high volume of compressed air or gas is a constant, heavy requirement.

Bauer Breathing Air uses the same modern facility and cost-efficient techniques to build all of their many compressor models. The same technicians work on and test each model, giving all of Bauer's employees familiarity with the entire product line. For this reason, many product improvements and manufacturing advances have originated with the production staff and working engineers. In fact, innovative research has been a trademark of Bauer Breathing Air since its inception almost three years ago.

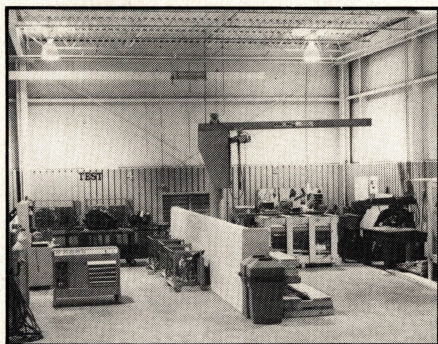
Bauer first pioneered the use of the Triplex system of air purification. After the air has been compressed, it is necessary to remove water particles, eliminate any odors or oil vapor, and remove carbon monoxide. The Triplex longlife cartridge integrates all of these functions into a single cartridge. In addition to this system, Bauer pioneered another breakthrough, the Securus system.

The Securus is a warning device for air purification systems. Mounted on the compressor, it monitors the purification cartridge and warns the user 5-7 hours before the chemicals become ineffective. If the cartridge is not changed, the system will actually shut the compressor down until the chemicals have been replenished. This is an economic breakthrough as well as a safety boon. Now cartridges can be used to the limit of their capacity but not beyond, ensuring both pure air and long cartridge life.



Next to the larger units found in dive stores, portable compressors are of the greatest interest to sport divers. Even though most divers live relatively close to a dive shop, many of the areas we'd like to dive aren't near one. Maine, with its 3500 miles of coastline and three or four dive shops, is a prime example. Baja, California is another good example. When I stopped in a dive store in Baja Los Angeles a couple of years ago, I was told the compressor would be ready to fill tanks in a couple of weeks.

Offshore islands or extended boat trips are also a good reason to own a portable compressor. Bauer has four models that weigh under 140 pounds and provide excellent reliability. The



Varius is the lightest model (80 pounds) and, rated to 5000 psi, pumps air at 2.3 cfm. In time spent out of the water, this translates to about one-half hour to fill a steel 72. The Varius, at 105 pounds, pumps 2.7 cfm. The next jump is up to portable compressors in the 137 pound range. The Utilus pumps 3.6 cfm and the Capitano delivers 5 cfm. These will bring filling time down to a little over one-quarter hour; excellent time when you consider you don't have to drive to the dive shop. More and more individual divers and clubs are taking advantage of the range and economy portable compressors provide to explore new areas.

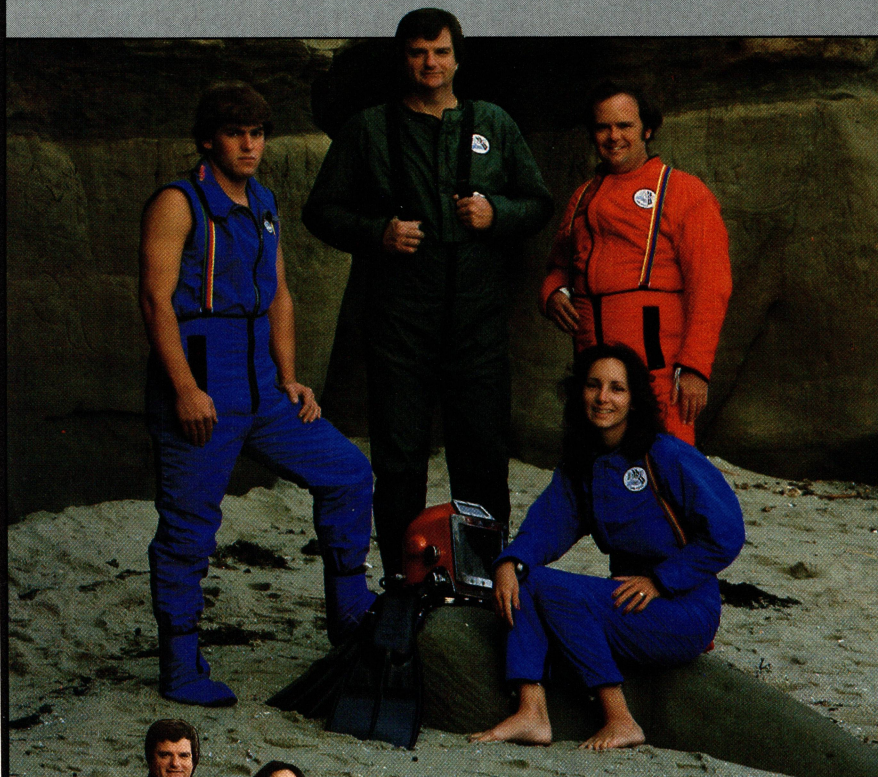
According to Chuck McCoy, buying a compressor is only the first step. You should know how to maintain it, perform minor repairs and find spare parts when you need them. Bauer offers training classes to familiarize owners with the basic knowledge that's required to service their compressors. In addition to these classes, Bauer maintains an extensive inventory of spare parts. The company carries all parts for at least seven years after the compressor is no longer made; longer if the demand still exists. This policy is augmented with 24 hour turnaround in parts replacement which, when linked with air service, spell good news if your address ends in an island instead of a zip code.

If you have any questions about Bauer Breathing Air compressors or the services the company performs, contact: Bauer Breathing Air, 1328 Azalea Garden Road, Norfolk, VA 23502; (804) 855-6006.

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# Scuba Quiz

## Category: Drysuit Diving

By Dennis Graver

Drysuits are increasing in popularity because staying warm makes diving more enjoyable. There are, however, a number of differences between wetsuit and drysuit diving. Find out what you know about these differences with this month's quiz. The answers are on the following page. *NOTE: Select all correct answers: Some questions have more than one correct response.*

**1. Which type of drysuit is best suited for recreational diving:**

- ☐ A. The loose-fitting foam neoprene type
- ☐ B. The snug-fitting foam neoprene type
- ☐ C. The snug-fitting, rubber covered canvas type
- ☐ D. Either type B or type C, but not type A

**2. Which of the following items of equipment should be worn with a foam neoprene drysuit:**

- ☐ A. Buoyancy control device
- ☐ B. Ankle weights
- ☐ C. Fin retainers
- ☐ D. Weight harness
- ☐ E. All of the above

**3. Which of the following items of equipment should be worn with a rubber covered canvas drysuit:**

- ☐ A. Buoyancy control device
- ☐ B. Ankle weights
- ☐ C. Fin retainers
- ☐ D. Weight harness
- ☐ E. All of the above

**4. Which of the following statements regarding suit blow-up is true:**

- ☐ A. Recovery from blow-up needs to take place within the first 15 feet of ascent
- ☐ B. An inverted swim-down followed by suit venting can be effective if initiated at the outset of blow-up
- ☐ C. Arching back while swimming down and regaining a head-up position can aid in recovery from an inverted blow-up
- ☐ D. Venting a suit from the wrist is a good method to eliminate excess air, but suit exhaust valves are effective for most situations
- ☐ E. Flaring out like a skydiver can dramatically slow one's rate of ascent

**5. Which of the following statements are false:**

- ☐ A. Drysuit seals tear more easily when wet than when dry
- ☐ B. If a drysuit floods, the diver will be unable to reach the surface unless the weightbelt is discarded
- ☐ C. Training in the use of drysuits is not required as long as the owner is an experienced diver and first uses the suit in a pool
- ☐ D. The zipper is the most expensive drysuit component

**6. Select the most desirable control valve configuration for recreational diving**

- ☐ A. Inflation and deflation with BC type hose and valve
- ☐ B. Low pressure inflation and BC hose deflation
- ☐ C. Low pressure inflation and manual vent valve
- ☐ D. Low pressure inflation and automatic vent valve
- ☐ E. Oral inflation and manual vent valve

**7. A drysuit keeps a diver warmer than a wetsuit because:**

- ☐ A. Less heat is lost by conduction
- ☐ B. The diver is insulated by a layer of air as well as the suit itself
- ☐ C. Drysuits are made of thicker insulating material than wetsuits
- ☐ D. All of the heat generated by the diver remains in the suit
- ☐ E. All of the above

**8. Select the incorrect statements:**

- ☐ A. The neck seal on a drysuit can lead to unconsciousness if too tight
- ☐ B. The need to meet biological needs underwater can be distressing when wearing a drysuit
- ☐ C. The buoyancy available from a drysuit makes it ideal for lifting heavy objects underwater
- ☐ D. Loss of the weightbelt is more serious with a drysuit than with a wetsuit

**9. To keep water entry to a minimum when orally inflating a drysuit underwater:**

- ☐ A. Use a mouthpiece which has a purge valve to clear the water
- ☐ B. Form the inflator hose into a U so any water inside will remain at the bottom of the U
- ☐ C. Blow into the suit gently to bubble air through any water in the inflator hose
- ☐ D. Perform all of the above steps in a horizontal, face-up position



# Scuba Quiz

## Answers: Drysuit Diving

**1. D. Either type B or type C, but not type A.** Loose-fitting, foam neoprene suits are for commercial use. Distance swimming is difficult with these suits and air shift problems can be serious. Snug (not tight) suits reduce these problems while still providing the advantages of a drysuit.

**2. B. Ankle weights, and C. Fin retainers.** Adequate flotation can be obtained without a BC, but one may be used as long as it does not interfere with the suit controls. Ankle weights help prevent air from ballooning the ankles and feet, and fin retainers help prevent fin blow-off. Weight harnesses, although used by some divers to make the heavy weights ride more comfortably, are not recommended for safety reasons. Drysuit divers tend to use too much weight, a practice which should be discouraged.

**3. A. Buoyancy control device, B. Ankle weights, and C. Fin retainers.** The ankle weights (two pounds each) and the fin retainers are used for the same reasons as for the foam neoprene suit. A BC is required with the rubber covered canvas drysuit because the suit cannot provide buoyancy like a neoprene suit can. External buoyancy will be needed if a canvas suit loses its air retaining capability — even if the weightbelt is dropped.

**4. All of the statements are true.** The longer one delays in correcting a blow-up, the more difficult it becomes. Swimming down hard as soon as the problem develops can reduce excess buoyancy to the point where control can be regained. Arching back with swimming movements to shift the air from the feet to the top of the suit can help in the recovery. Wrist seal venting is the fastest way to rid a suit of air, but shouldn't be required as the control valves are adequate. Flaring slows an ascent drastically. All of these techniques need to be learned by drysuit users prior to actual dives with such specialized equipment.

**5. B. and C. are both false. A. and D. are true.** It is possible to swim to the surface with any type of drysuit which has flooded, although it is more difficult with the rubber covered canvas type and that type will also require external buoyancy once at the surface. Drysuit diving requires training before open water use. Most retailers who sell drysuits include training with the purchase. Don't neglect this instruction and the opportunity to practice under controlled, supervised conditions.

**6. D. Low pressure inflation and automatic vent valve.** Low pressure inflators are recommended for buoyancy control devices as well as for drysuits. The inflators allow one hand buoyancy control and keep the regulator in the diver's mouth where it belongs. While not widely available, automatic vent valves, which can be adjusted for buoyancy, are desirable because a diver's buoyancy can be kept constant during ascent without periodic manual venting.

**7. A. Less heat is lost by conduction, and B. The diver is insulated by a layer of air as well as the suit itself.** Water that enters a wetsuit must be heated by the diver, and this water conducts heat away from the diver 25 times faster than air would. Eliminating the water overcomes the conduction problem. By wearing garments under a drysuit, the insulation is much greater than that provided by a wetsuit. The garments maintain an air space between the suit and the diver, and air is a good insulator.

**8. C. The buoyancy available from a drysuit makes it ideal for lifting heavy objects underwater.** Wrong! If personal buoyancy is used to lift an object and the object slips out of your grasp or must be released, you will be shot to the surface in an uncontrolled ascent. *Never* use personal buoyancy to offset more than a few pounds of extra weight. Lift bags are designed for salvage work and should be used for lifting.

**9. A, B, and C are correct. D is incorrect.** It is really a shock to blow cold water into a suit via the oral inflator. Learn the techniques to prevent this or, better yet, invest in a low pressure inflator. Oral inflation should be done in a face-down position so gravity can be used to help keep the water out and so inflation can be carried out with minimal pressure differentials between the lungs and suit.

*I hope this quiz has made you aware of some aspects of drysuit diving that were previously unknown or not considered. If you dive with a drysuit and did not score well on the quiz, go to your retailer and learn more about using your suit. If you plan to purchase a drysuit, be sure to obtain training in its use. Diving can be more comfortable in a drysuit, but it needs to be safe as well.*



# SPEARFISHING

## ONE SCIENTIST'S VIEWPOINT

BY DR. HEYWARD MATHEWS

In recent years there has been a heated debate over the impact of spearfishing on reef fish. Some people, even divers, have called for a total ban on spearfishing and a few Florida counties have passed restrictions in some reef areas.

Unfortunately, those advocating these laws have little or no knowledge of the ecology of these reefs and no scientific data to back up their belief that spearfishermen are slaughtering all of the game and food fish. I am an oceanographer with 24 years of dive experience, twenty of which have been spent studying artificial reefs. In those years of study, I have found spearfishing to be no more destructive to reef fish populations than line fishing or net fishing. For a decade now, Pinellas County — on Florida's west coast — has been the leader in artificial reef development in the country, spending over \$150,000 a year since 1974 in the construction of a system of ten onshore and offshore artificial reefs. These reefs have utilized scrapped tires, derelict vessels, concrete culverts, bridge rubble and a variety of other permanent materials. As the originator and chief scientist of this project, I have studied these reefs from their start as well as monitoring adjacent natural reefs. Under Florida Sea Grant funding, I have traveled extensively around Florida's coast helping numerous local groups start artificial reef projects. At this time, all of these artificial reefs allow spearfishing, along with line and net fishing, and none has yet been known to have its fish population damaged by spearfishing.

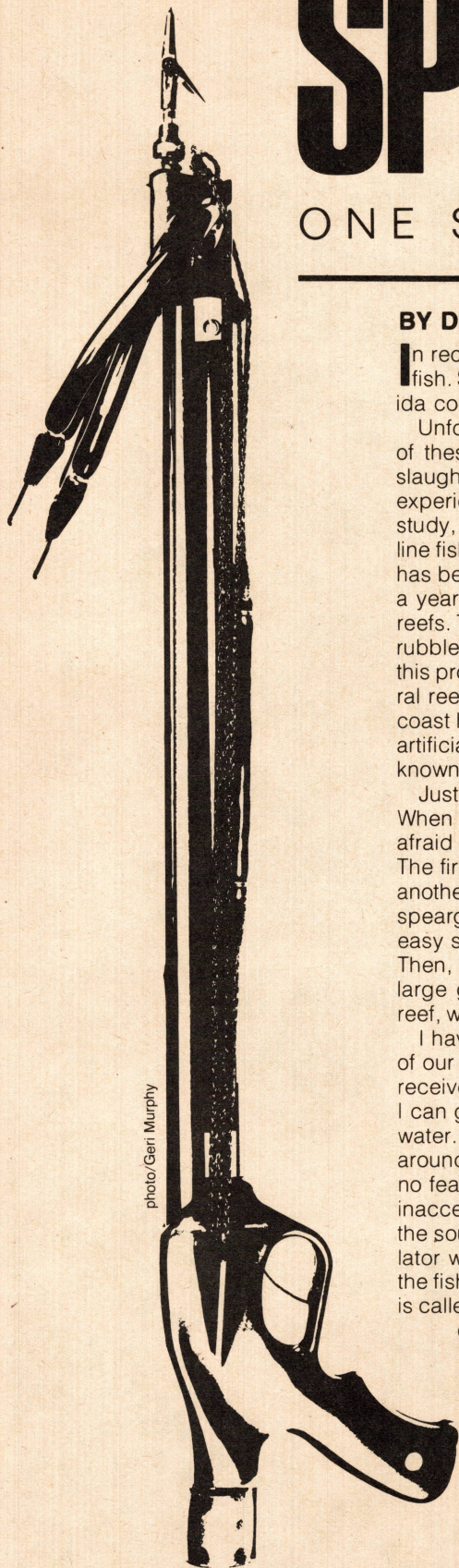
Just for a minute, let's stop and compare spearfishing with conventional line fishing. When a diver first visits a virgin reef, the game fish, like grouper and snapper, are not afraid of the intruder and are often even a bit curious. Then the speargun begins to shoot. The first few shots are easy, but in a very short time the game fish realize this intruder is another predator to avoid and begin to seek shelter. Soon, larger fish are staying out of speargun range or going undercover. The next diver to visit that reef will not have such an easy shot to start with and will have to be a good shot to pick up even a few large fish. Then, the amateur ecologist makes a dive on the reef. Since he/she does not see any large grouper or snapper, he/she quickly concludes that spearfishing has ruined the reef, when, in fact, the larger species have simply gone into hiding or moved out of sight.

I have personally observed this reaction by black grouper and red snapper at several of our artificial reefs in 50 feet of water. One reef in particular — a World War II LSM — receives very heavy pressure from divers as well as sport and commercial line fishermen. I can get into the water on a clear day and see the entire 245 foot ship below me in the water. There may be anywhere from five to ten large grouper and snapper swimming around freely on the bottom. As long as I use my snorkel to watch, they move around with no fear. But the first breath off of my regulator and the grouper dive for cover within the inaccessible interior parts of the ship, and they will not venture out for several hours after the sound of divers has ended. The fish have learned to associate the sound of the regulator with a predator. Spearfishermen can never decimate the reef population because the fish will soon learn to avoid the diver. Remember that most of these species have what is called a lateral line system which allows them to feel vibrations underwater. The fish can detect the movements of a diver long before it can see the diver.

With hook and line fishing, however, the fish are not so fortunate. There is no distinctive sound to associate with danger and the bait is much needed food. The fish do not spook so the angler can soon catch all of the larger fish in a given area if the bait holds out. The angler is also far less selective in the taking of fish from the reef. Few fishermen will return non-game species to the water undamaged. Indeed, if it is what is considered a trash fish, the fisherman will deliberately kill it and then drop it overboard for chum. How many spearfishermen go around shooting toadfish, catfish, small grunt and other such species? Very few! Most are selective, shooting only the food

(Continued on Page 121)

photo/Geni Murphy





# Metzeler Elefant

**the largest, toughest boat in the line**

BY ERIC HANAUER

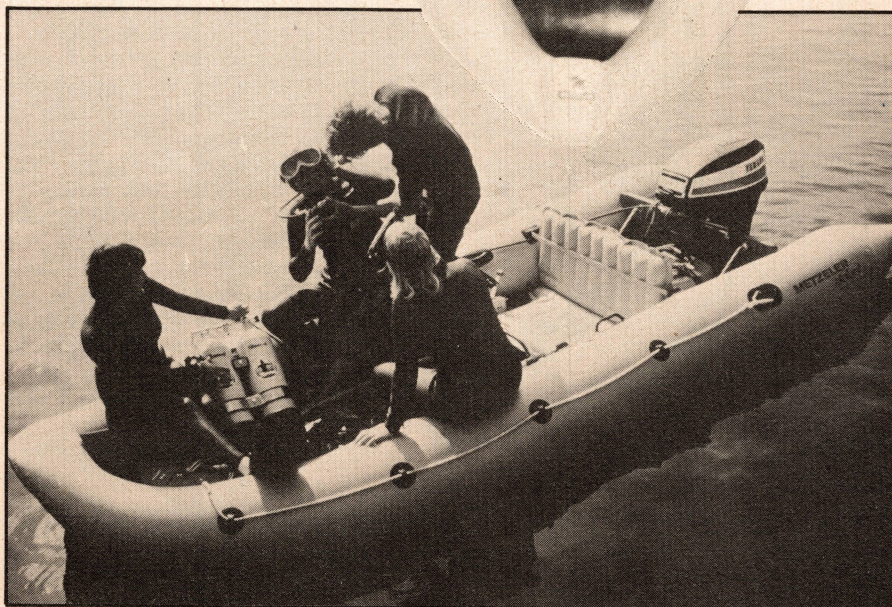
**T**o the uninitiated, all inflatable boats look just about alike, and it's hard to tell one brand from another. That's not true of the Metzeler Elefant. First of all, it's bright orange-yellow. In Helmut Peters' opinion, "Submarines are gray because they are supposed to be invisible. Inflatable boats should be seen." Helmut knows about submarines, having served as a radioman on German U-boats during World War II. He also knows about inflatables, having introduced the Metzeler line to the United States in 1973. Today, his Inflatable Boat Center in Santa Monica is the West Coast distributor for Metzeler.

The name predates the boat by nearly 70 years. Metzeler began manufacturing tires in Germany in 1886. The elephant was adopted as a trademark to personify the toughness of the tread. It remains the corporate symbol to this day. When the company began manufacturing inflatable boats in the late 1950's, the name Elefant was assigned to the largest, toughest boat in the line.

Essentially a 25 year old design, the Elefant has undergone only minor changes. Yet even today, several of its features are unique.

One of the most unusual features is the extension of the floorboard beyond the transom on either side of the outboard motor's driveshaft. The overall effect is like that of trim tabs on a large powerboat. The tabs catch and channel the turbulence of the prop to provide a lifting effect. While other boats go up on a plane bow first, the Elefant rises as a unit. The result is a smooth, stable ride

**All inflatable boats do not look alike. The Metzeler Elefant has a distinctive color (it's orange) and several unique features. Nose turns up, the stern cones down. It also has curved bowboard and hinged transom.**





with less power required. Although it will accept up to a 55 horsepower engine, a 40 is recommended for diving and a smaller engine is adequate for general use.

The transom is also different because it is not permanently glued to the tubes, but attaches to the rear floorboard by means of a stainless steel hinge. The transom angle is maintained by a pair of steel struts. This equalizes the weight and bulk of the two packages in which the boat is stored. If the transom is broken, it can be replaced easily.

When I arrived at IBC, the boat was on the warehouse floor in two separate packages. Helmut's son, Mike, explained that he wanted to show me how easy set up is. I was skeptical, prepared for a long delay. But Mike proceeded to turn the big orange bag into a boat within 20 minutes, assisted by a power inflator. The floorboards are easy to assemble and their unique design is one of the strong features of the Elephant.

The bowboard has an upward curve, and goes further forward than that of any other boat. This reinforces the bow and prevents slop, or bow distortion, which can increase water resistance. As a result, a fixed thrustboard is not needed to stabilize the floorboard assembly. Vertical runners reinforce the individual floorboards while side battens keep the assembly from buckling at high speeds. The short battens fit easily into place with the floorboards already in the boat, then are held rigidly in place by the high inflation pressure.

The Elephant requires 4.2 psi in its two pontoons, the highest pressure of any inflatable boat. Peters explains that the Kevlar polyester base fabric does not stretch like nylon, therefore it can take a

third again as much air as other inflatables. All the air is contained in the two tubes, which are not divided into separate, smaller chambers. This is consistent with Metzeler's design philosophy, which states that rigidity is of paramount importance, and chambering can compromise that quality. As far as safety is concerned, Peters stated, "Punctures almost always occur below the waterline, so plenty of air remains trapped in the pontoon."

Safety is further assured by the rugged, quality materials used in construction. The Kevlar fabric is coated with neoprene on the inside, and a neoprene/hypalon combination on the exterior. The material is one millimeter thick, a standard feature. The material, along with the floorboards of laminated marine plywood, bring the weight of the Elephant to a hefty 211 pounds. That's a lot for a 14 foot boat, but is consistent with its namesake.

When viewed from the side, the Metzeler's tail cones present a droopy profile, somewhat like Snoopy's nose. That puts more of the cone into the water, resulting in a keel effect for more directional stability. The price of the added stability is a larger turning circle.

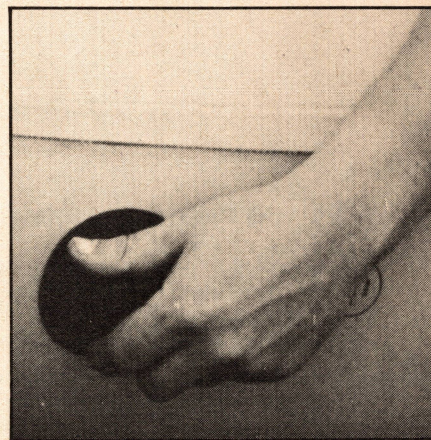
At the other end, the high kick-up in the Elephant's bow protects the passengers from splash in all but the roughest water and the highest speeds. Therefore, a bowdodger isn't needed and more room is available for dive equipment and passengers. The result is a large, open boat. Four interior rubber grab handles are provided for passengers to hang on to during rough rides. The handles can double as tie-down rings for equipment.

As is the case with most inflatables

these days, the inflation valves are plastic. In addition to lower cost for replacement, the advantages are resistance to corrosion and freezing. The male valve body unscrews completely for rapid deflation. A hand pump is provided for inflation. It pushes air on both the upstroke and the downstroke, and also features a built-in pressure gauge. The pump is made entirely of plastic, so it should hold up well in a saltwater environment. For owners who dread long sessions with manual pumps, several electrical models are available, some of which can plug into a car's cigarette lighter.

Two drain holes are built into the base of the transom, but they are not supplied with one-way valves. That is surprising, since most inflatables now have that feature. However, the owner can obtain the valves from an outside source and install them himself. The only other option needed to go diving would be a mat to protect the floorboards.

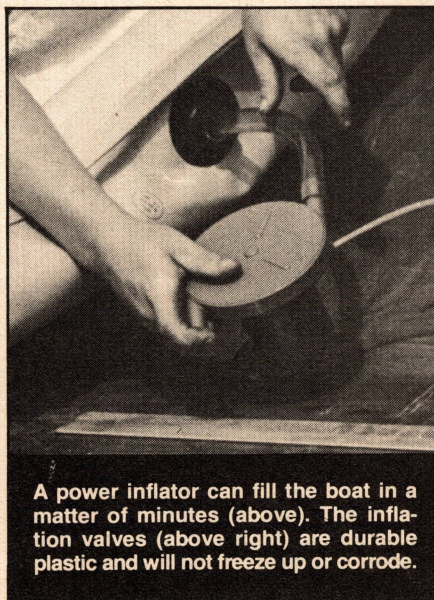
Where, then, does the Metzeler Elephant fit into the inflatable dive boat picture? At 14 feet, eight inches and 211 pounds, it is a bit big to carry on a car-



photos/Eric Hanauer

#### METZELER ELEFANT

Exterior length .....	14'8"
Exterior width .....	6'
Interior length .....	10'8"
Interior width .....	3'1"
Tube diameter .....	18", tapered
Assembled weight .....	211 pounds
Payload .....	1320 pounds
Passenger capacity .....	4 divers
Maximum horsepower .....	.55 hp
Number of chambers .....	2 + keel
Materials .....	Kevlar polyester/ neoprene/hypalon
Color .....	Yellow-orange
Price .....	\$2659



A power inflator can fill the boat in a matter of minutes (above). The inflation valves (above right) are durable plastic and will not freeze up or corrode.

top. However, owing to the ease with which it can be set up, I would classify it as a portable inflatable. If the owner wants to transport it inflated, it would have to ride on a trailer. The factory rates it for five passengers. Normally, we would reduce that number by one-third to one-half to rate diver capacity. However, in this case the factory is conservative. Because of the wide open deck space it can accommodate four divers with full ocean gear. The Elephant's rugged, quality construction and generous interior space combine with good handling qualities to rank it as an excellent dive boat.

With the dollar holding strong against the German mark, the Elephant lists for \$2,659, complete with paddles, pump, repair kit, packing bags and boat polish.



THE ZEPHER

# The Zepher



## TEXT AND PHOTOGRAPHY BY GEORGE COZENS

**Z**epher is the name given to a brand new servo-controlled regulator scheduled for release by Seapro, Inc., at about the time this article goes to print. Zepher, which is actually just the second stage, is a radical departure from conventional second stage design and appearance. It is the creation of Dr. Tony Christianson, who also designed a servo-controlled regulator, introduced in 1976. That earlier regulator demonstrated the feasibility and the high performance breathing characteristics of servo-controlled second stages. In fact, it soon became the standard of comparison in regulator performance. However, maintenance considerations and rising costs resulted in that regulator being discontinued in 1979.

So, back to the drawing board. Utilizing the patents from the original servo-control design (plus a couple more along the way), and the field experience gained from three years of use, Christianson spent another three years redesigning the second stage from the inside out. The result of all this effort is the Zepher. It has a completely new servo-control valve, designed with an emphasis on simplicity (the valve mechanism has half the number of components of the original design), reliability, ease of maintenance, high performance, and lower manufacturing costs.

Operation of the Zepher is an interesting blend of mechanics and pneumatics. As the diver inhales on the mouthpiece, the slight negative pressure created inside draws the diaphragm inward. This movement is transmitted via a hinged lever mechanism, which pries two stainless steel balls apart. One of the balls can't move, but the other one, when dis-

placed, pushes on the end of a valve. This pilot valve is very small, and only opens a few thousandths of an inch (a distance equal to about the thickness of ordinary paper), allowing air from the first stage to enter a small, flat control chamber. Because the chamber is so small, pressure in it builds up rapidly, almost instantaneously it musters enough force to push open the main flow valve, and air reaches the mouthpiece.

The design is quite ingenious — that's probably why so many patents were issued. Because the arrangement of the hinged lever (in prying apart the balls) provides such a tremendous mechanical advantage (big leverage) in opening the pilot valve, and because the pilot valve itself is so small and easy to operate, the Zepher is extremely responsive to the inhalation demand of the diver. It should be emphasized that air pressure, not the diver, does the work to open the main valve. And, since air pressure does the work, the flow passages in the main valve can be made larger, resulting in a greater flow capacity.

The main valve is completely balanced, and, therefore, not affected by changes in the intermediate air pressure. The pilot valve, however, is slightly unbalanced — functioning as a relief valve to vent overpressure. Should the first stage leak and the intermediate pressure climb to about 260 psi or more, the pilot will open, causing the main valve to dump the overpressure. The critical parts of the Zepher valves are protected from water, salt, sand and other contaminants either by an internal silicone rubber boot or O-ring seals. Hence, the Zepher should not experience leakage owing to sand or grit in



the mechanism, nor should it freeze or ice-up when used in cold water. Also, since water does not come in contact with critical parts, internal corrosion is greatly reduced, if not eliminated. Corrosion shouldn't be a problem anyway, since the case is impact resistant plastic and the internal parts are stainless, chrome plated brass, plastic or rubber. All of this protection should produce obvious benefits in reliability, performance, and in the ease and cost of maintenance.

In most servo-controlled regulators, the openings in the pilot and/or main valves are quite small, and are subject to clogging by contaminants from the air supply. If this occurs in a typical pilot regulator, the result can be reduced air flow through the main valve, or, perhaps, a malfunction of the pilot valve — which could prevent the regulator from operating. The Zepher, however, is not typical: If, for some reason, the pilot valve should fail to function, a unique, built-in, mechanical override will bypass the pilot, and the regulator will continue to operate (but at a greater inhalation effort).

When the diver stops inhaling, slight positive pressure builds up within the case, pushing the diaphragm out to its original (neutral) position. This action closes both the pilot and the main valve. Upon exhalation, air is exhausted through the dual-purpose diaphragm/exhaust valve, and exits to the side of the unit. This valve has a unique design: it consists of two, silicone rubber, cup-shaped diaphragms, joined at their edges with a clip that extends over about one-half of their circumference — in somewhat of a "duckbill" arrangement. Exhaust air leaving the mouthpiece is channeled (through a hole in the center of one diaphragm) to the space between them, and from there is vented to the water, by opening the unclipped edges of the diaphragms (which act like flapper valves mounted back-to-back). This design greatly reduces the possibility of free flow through the exhaust valve, regardless of the diver's orientation, and provides an exhaust opening that is considerably larger (for less exhalation effort) than

typical mushroom exhaust valves.

Because free flow can be a problem with just about any easy breathing regulator when it is out of the diver's mouth (assuming the air supply is turned on), the Zepher is equipped with a snap action Lockout Button, at the end of the case, opposite the purge button. Pushing this grooved button greatly increases inhalation resistance, thus eliminating free flow, while allowing the regulator to operate in a low performance mode. The Lockout Button can be disengaged, with a return to high performance operation, by: 1) Depressing the purge button; 2) Taking a strong, rapid inhalation on the mouthpiece; and 3) Physically pulling the Lockout Button out with the fingers. Because the Zepher can deliver air so forcefully, the purge should not be pushed with the unit in the mouth.

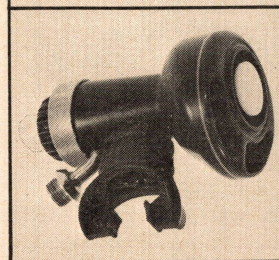
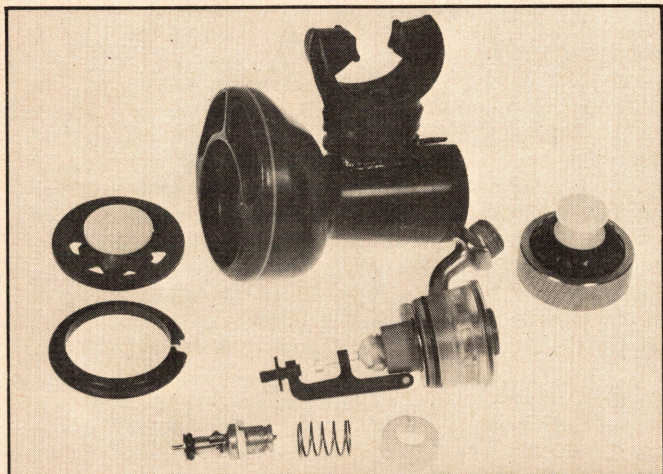
Although the Zepher is a sophisticated second stage, it should require no special maintenance: A thorough rinsing in clean, fresh water after use is, generally, the only care needed. It is strongly recommended that this freshwater cleaning be done with the Zepher still attached to a scuba tank. If not, water, sand and other gunk could get into the valve interior should the purge button be depressed. After rinsing, purge the unit and depress the Lockout Button.

A commendable feature of the Zepher is the ease with which it can be adjusted. The only tool required is a small (one-eighth inch) slot screwdriver. No disassembly is necessary. The regulator should be connected to a tank or other air supply at about 1000 psi or more of pressure and the Lockout Button pulled out. The screwdriver can then be inserted into the Zepher's mouthpiece, and an adjusting screw turned until the second stage starts to free flow. Back off the screw slightly and the adjustment is complete. This is so easy the Zepher can be given a quick tune-up after many hours of diving, or after extended storage.

Another nice feature of the Zepher is its modular design, which greatly facilitates servicing. The unit can be easily disassembled into its components, the most critical of which is the pilot assembly. This can be overhauled by a trained technician and/or exchanged for a factory replacement. Such a procedure allows divers in remote areas to service their own Zephers, with only minimal instructions, a few simple tools and a spare pilot assembly.

As mentioned above, the Zepher is brand new. At the time of writing only a couple of prototypes existed in the entire world. I used a prototype for my own evaluation, in pool and ocean dives. Try as I might, I just couldn't out breathe it. The Zepher supplied air with very little effort, from sipping to extremely large inhalations. Exhalation resistance was also quite low. With the unit held away from my mouth, free flow characteristics were about the same as those of other high performance regulators — but with the Lockout Button depressed, free flowing was eliminated. With regard to idiosyncrasies, I can recall only one: A popping was created when I inhaled in short, chopped steps . . . this was probably owing to the main valve trying to follow my strange breathing pattern. With a smooth inhalation, however, the popping stopped. A small amount of water seemed to seep into the unit occasionally during dives. This was believed to be owing to a temporary mouthpiece on the prototype, and should be corrected with the use of a newly designed mouthpiece on the production version of the Zepher.

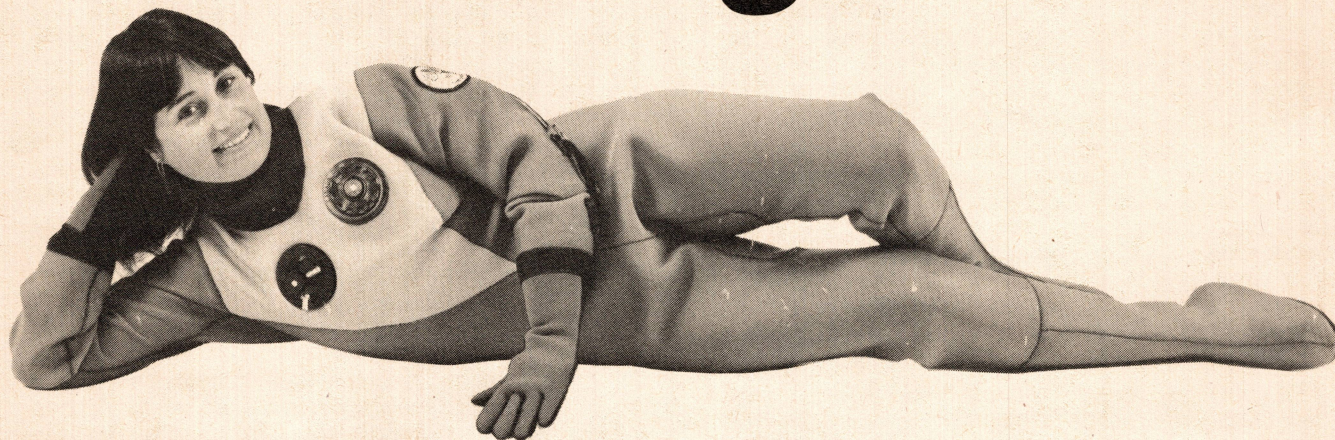
Seapro will offer the Zepher second stage separately for \$175; with the FSDS 10 (balanced piston first stage) for \$238; or with the FSDS 50 (dual piston first stage) for \$402. For use where high sensitivity and high volume are desired, try the Zepher. For more information contact: Seapro, 18030 S. Euclid, Fountain Valley, CA 92703.



**The Zepher is a servo-controlled regulator second stage. It incorporates side exhaust and unique valving to make an extremely responsive breathing machine. A special Lockout Button (opposite purge) eliminates free flow.**



# DUI's Argonaut



## A Drysuit System For All Seasons **By Bonnie J. Cardone**

**D**UI's Argonaut can be worn in all weather in all waters: In icy waters, warm tropical waters, or waters of any temperature in between. That's because the Argonaut is a system — a drysuit and a four-piece set of thermal underwear.

The center of DUI's system is the Argonaut. Most drysuits are 1/8, 3/16 or 1/4 inch neoprene. The gas blown Rubatex of which the Argonaut is constructed is only 3/32 of an inch thick. This makes it drape and feel more like cloth than rubber and results in a flexible, incredibly comfortable drysuit. There are certain design features which also increase comfort. One of these is the special "cloverleaf crotch," which has no seams. Another is the diamond shaped under-arm seam, which also adds strength.

The Argonaut has conical wrist seals. These keep water out simply because they fit so tightly. The tight fit makes them hard to get into on any other suit. The Argonaut's creator, Richard Long, president and owner of DUI, designed special inner cuffs of nylon for his drysuit. These are sewn into the suit and allow fingers, hands and wrists to slip through the seals easily. The neck has skin outside, nylon inside. It folds down inside itself to seal.

There is a variety of valves available for the Argonaut. If the valves from your old drysuit are still working well, DUI will install them in your new Argonaut for \$30. My test suit had Canada Dri Valves, made by White's Water Wear of Canada. One of these attaches to a power inflator, the other provides manual deflation when the button in the center is pushed.

As with most drysuits, you don the Argonaut through a heavy-duty brass

zipper that stretches from shoulder to shoulder on the back.

Seams can be a problem in drysuits because they tend to leak. The outside seams on the Argonaut are sewn and glued. The inside seams are stripped of their nylon coating for one-quarter inch on either side, glued and then covered with a strip of neoprene. Thus, there is a rubber to rubber seal instead of a rubber to nylon seal. DUI guarantees the seams will not separate for the life of the suit.

The Argonaut is available in several colors, in either nylon two sides or Lycra outside, nylon inside. It also comes in one-quarter inch neoprene. Other options include: attached or separate booties; attached or separate hood; elbow pads; knee pads; and several kinds of pockets. You can buy a stock suit or order one custom made. You can also order gloves to match your suit — DUI's are specially contoured to fit the hand and be flexible. The booties, whether attached or separate, have a sturdy, textured rubber sole.

The thermal underwear really adapts the Argonaut to all weather use. All four pieces have a Thinsulate core sandwiched between two layers of nylon. All edges are covered with sewn on seam tape. Thinsulate is a synthetic polypropylene material made by 3M. It does not absorb water, is very light and thin, almost non-compressible and a super insulator. A piece of Thinsulate resembles the foam from which disposable coffee cups are made, only softer.

The thermal underwear jacket or vest has a full length, heavy duty YKK Delrin zipper. To keep the jacket sleeves from

riding up when you are putting the drysuit on, there are elastic loops that slip over your thumbs. When your hand is through the wrist seal, slip the loop off and it will retract inside the suit. The thermal pants have a waist-to-crotch and two ankle YKK Delrin zippers. They are held up by colorful suspenders attached to the pants by nylon rings and seam tape. Elastic stirrups go under the instep of the foot to keep the pant legs in place. The soleless booties fasten around the ankle with Velcro strips. There is also a hood, which I did not test.

The thermal underwear can be machine washed and dried. The advantage of having four separate pieces of underwear is that you can add or subtract them according to your needs. If you are diving in tropical waters, you will not need any thermal underwear: In icy waters you will need all of it.

The Argonaut I received for test purposes was a beauty; shiny bright blue Lycra with silver inserts, black neck and wrist seals and attached booties. The thermal underwear was bright blue.

Richard Long believes there would be more women diving if they could look good, feel comfortable and not have major hassles with their equipment. The Argonaut definitely does *not* promote the unisex look: It curves where you do. It is easier to put on than conventional drysuits, thanks to the special inner cuffs and the thinness of the neoprene. I needed help only with the zipper.

I first tried the suit with all of the underwear, plus the matching neoprene hood and gloves. After several dives, I had eliminated some pieces while adding



some of my own gear, and, I had a system that worked for me. The one drawback to Thinsulate is that it is very buoyant. Much like the foam disposable coffee cup I compared it to earlier, it floats. With all of the underwear, I was too buoyant even with 10 extra pounds of lead. And, in Southern California's 54°F waters, I did not need all of the underwear for warmth. Thus, I eliminated the thermal booties and the pants, substituting a pair of woolen tights for them. Woolen socks would probably work just as well. Minus the booties and pants, I needed only seven extra pounds of lead to be neutrally buoyant on the surface. I had found the thermal pants rather constricting anyway. Swimming was no problem but they did limit movement topside. However, if I needed their warmth, I would not hesitate to wear them.

After a couple of dives, I also decided against wearing the DUI hood and gloves. Although they were comfortable and flexible, they were too thin (3/32) to keep my head and hands warm. Thus, I wore my own 1/8 inch gloves and 3/16 inch hood. If you are going to be diving in

cold water, I would recommend you order these items in 1/8, 3/16 or 1/4 inch neoprene. You can also order a thermal hood to wear under the neoprene hood.

Did the DUI system match my expectations? Yes, and it actually exceeded them. I was warm and dry. The valves leaked slightly when I added or vented air, but only the outer covering of the thermal jacket got wet. Since Thinsulate does not absorb water, the inside of the underwear remained dry, as did I. The suit was very comfortable during surface intervals and most of the time I didn't even bother to unzip it. Also, it is so flexible that underwater I had this peculiar sensation of wearing almost nothing at all but, at the same time, being warm and dry.

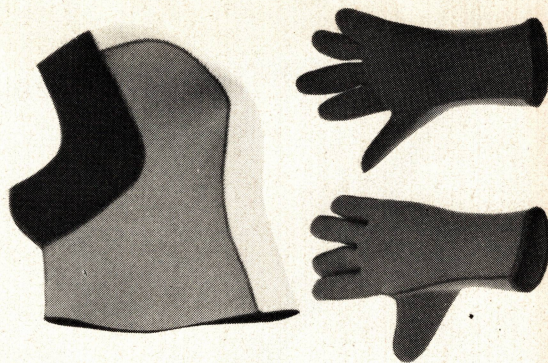
I do have a word of caution: Neoprene that is only 3/32 of an inch thick is not as puncture proof as 1/8 or 1/4 inch rubber. If you are rough on your dive suits or dive around coral or shipwrecks, you should protect your suit by adding knee and elbow pads, wearing coveralls, or both. This is a small sacrifice to make for being warm, comfortable and able to move well. If you need a really tough suit, look

into DUI's CAT II, which is a more rugged version of the Argonaut.

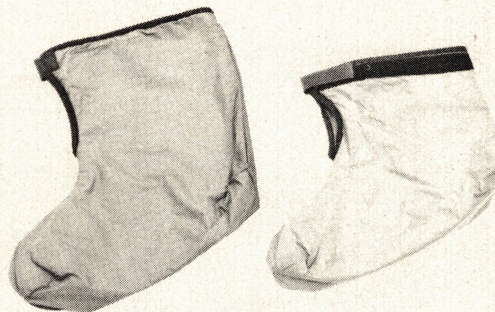
DUI stands for Diving Unlimited International. The company is headquartered in San Diego and has an overseas office in Aberdeen, Scotland. Although DUI has been in existence for 21 years, it had gotten out of the sport diving market and concentrated solely on commercial diving for the past several years. DUI hot water suits are worn by commercial divers worldwide.

With standard inflator hose, the Argonaut retails for \$485: boots, hood and gloves, power inflators and valves are extra. The thermal underwear is sold separately. It comes in three colors (green, red and blue), five sizes (and custom made) and two Thinsulate thicknesses (1/16 and 1/8). The standard 1/16 inch jacket is \$99; the vest, \$89; pants, \$81; booties, \$45; and hood, \$30. The 1/8 inch thermal wear is slightly more.

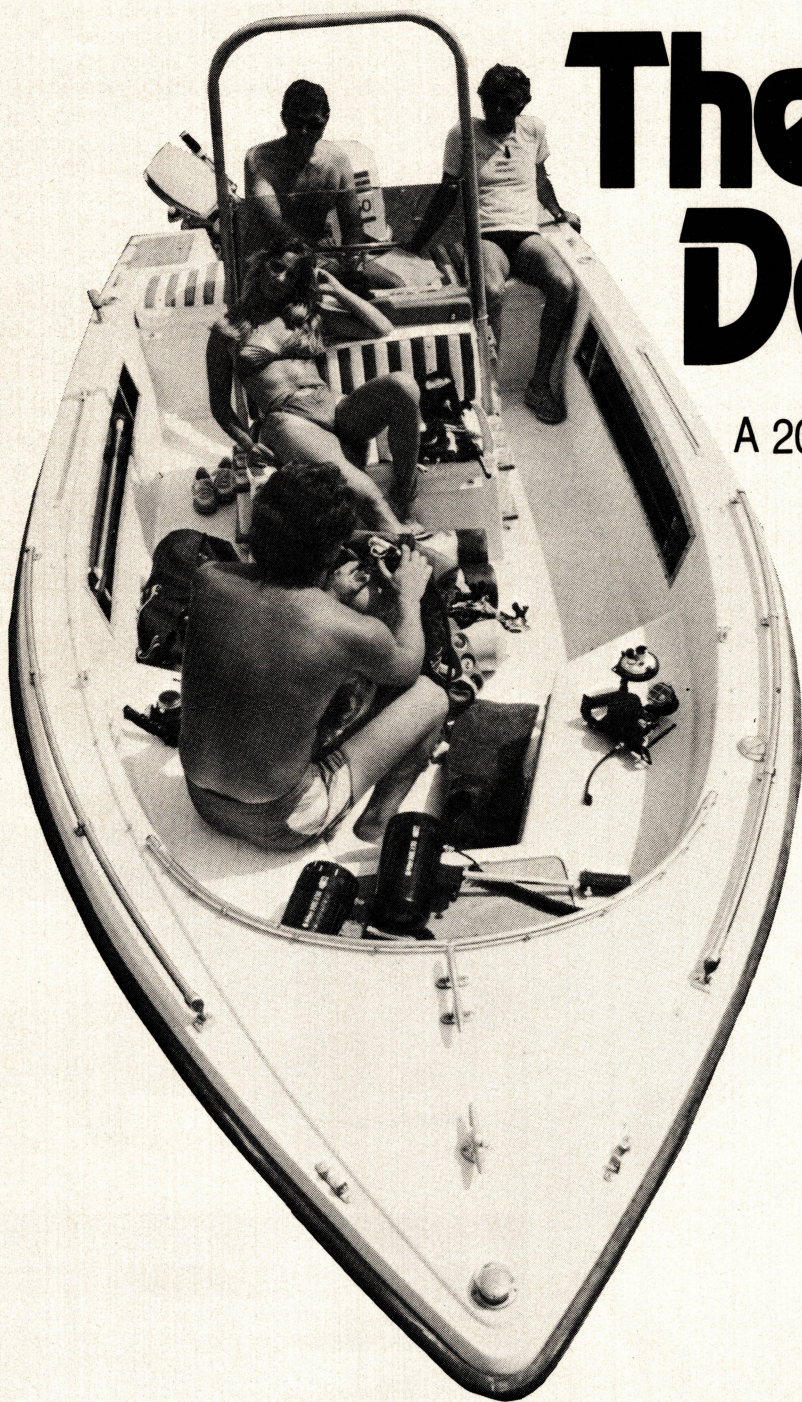
For more information on the Argonaut drysuit system or a DUI catalog write: Diving Unlimited International, Inc., 1148 Delevan Drive, San Diego, CA 92102. >



The DUI Argonaut is a drysuit system consisting of the Argonaut drysuit with attached or separate booties; thermal underwear jacket, pants and booties; attached or separate hood and gloves. Components are added or subtracted for more or less warmth.







# The Super Dolphin

A 20ft Dive Boat You Help Design

TEXT AND PHOTOGRAPHY  
BY STEVE LUCAS

If you've ever been tempted to build your own dive boat because you just couldn't find one that had the features you wanted, we have a solution! In fact this boat will not only let you have it your way, it will probably save you some money and get you a trip to the Florida Keys as well.

We found this little jewel just north of Key Largo, home of some of Florida's finest diving, at the Dolphin 20' Boats, Inc. factory in Homestead. Dolphin 20' has been building boats in southern Florida for quite a number of years and has turned out hundreds of this particular model, the Super Dolphin. The boat is actually 19 feet 6 inches in length with a beam of seven feet seven inches. Built as a multipurpose boat, the basic hull can be added upon to produce just precisely the type of boat that you need. And, our SKIN DIVER test proved the boat is rugged, very rugged!

Jack Broyl, president of Dolphin 20' must have some hidden desire to be a rodeo bull rider, because he put the Super Dolphin through some rough and tough maneuvers on the way to the northern Pennekamp Park reefs. The sea began at something over a chop, quickly jumping to one foot and then up to three feet plus. The boat began running at a speed of 40 knots and never slowed down. If you have ever been in an open boat in rough water, with a crossing sea, you know spray will come over the side and everything in the boat will get wet — but this did not happen on the Super Dolphin. The boat is fast, comfortable and dry because it is a scaled down ocean racer. In addition to the speed tests, Broyl wanted to make sure we had a chance to see how well the boat maneuvered. He made a 90 degree turn at 35 to 40 knots, and the

## DOLPHIN 20 SPECIFICATIONS

Centerline length	19'6"	Minimum cockpit depth (at stern)	21"
Beam	7'7"	Max total horsepower (outboard)	185 hp
Height (keel to top of hand rail)	5'8"	Outboard capacity (persons, motor & gear)	1850 lbs.
Weight (without engine)	1550 lbs.	Max horsepower (sterndrive)	unlimited
Draft, hull (engine tilted)	13"	Sterndrive capacity	
Transom height (outboard)	25"	(persons & gear)	2380 lbs.
Degree deadrise (hull at transom)	24°		



boat did not skid. This fast maneuvering and stable ride is owing to the deep V-construction. The V runs all the way to the stern without tapering off.

To make sure that his boats will stand up to this type of pounding, Broyl builds each one by hand. His craftsmen custom design each one to the owner's specifications. Dolphin Boats is a factory direct operation with no dealer between you and the manufacturer. The boats are all fiberglass construction and all stringers are laid up with layers of fiberglass over foam flotation. In addition there are no screws. Parts that normally would be joined by a screw have been bolted together with stainless steel hardware.

The SKIN DIVER test boat was a six year old factory demonstrator, equipped with a 150 hp outboard. Owners may choose outboard motors up to 185 hp, stern drives with unlimited power, or jet-drive. Of course the type of power immediately dictates the inside room of the boat as an inboard/outboard will take up more room than an outboard alone. Either way the boat is roomy enough for a party of four divers with a load of gear

and is Coast Guard approved for up to seven people. Ample storage is allowed in the outboard configuration with a locker that runs across the stern of the boat and doubles as a seat. Additional storage can be found under the bow seats and console.

Dolphin uses the standard center console in the Super Dolphin. If you prefer a side console, order the less expensive commercial model which has fewer frills. The standard Super Dolphin with center console has a base price of \$6,495 (less trailer and engine) while the commercial model starts at \$4,495 with either center or side console. The commercial model has no forward or center seating and no interior side wall.

The list of standard equipment on the Super Dolphin is impressive, in fact far too long to list here. Some features the diver will appreciate are: 1) insulated ice box just forward of the center console, 2) upright, level flotation even when fully flooded, 3) twin recessed speargun or rod holders under the gunwales, 4) anchor locker with teak hatch, 5) automatic bilge pump and switch, 6) 47 gallon

aluminum fuel tank secured with stainless steel straps, 7) baitwell with teak hatch, 8) battery storage with teak hatch, 9) six foot wide stern storage compartment, and 10) water separating fuel filter.

Factory installed options are equally extensive. For example, there are 175 color combinations to choose from and the seat cushions have over 500 combinations. A teak dive platform (one side only), with a stainless steel swim ladder strong enough to hold a fully geared diver, is only \$175. Our test boat had only the ladder with no platform and although the platform would have been nice, the ladder was easy to use. If you plan to use the boat on longer runs, you can exchange the fuel tank for the larger 60 gallon model for \$70. Either tank can be easily removed should it be necessary — they are not molded in the hull. If you need more dry storage, you can add teak doors to the forward and console compartments. You can add a Bimini top for sun protection and a bow spray hood with backdrop privacy curtain.

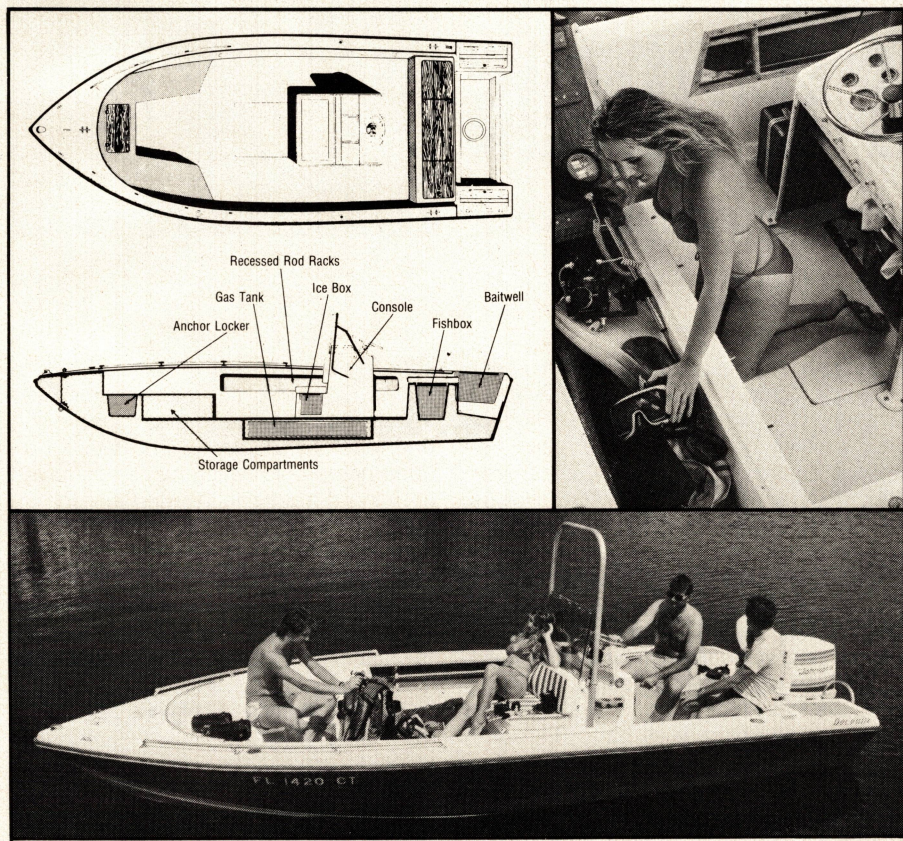
Most divers will want the optional plexiglass viewing windows. These one inch thick Lexan windows are located just behind the center console and are reached by lifting open a hatch in the deck. The ports are located far enough aft to allow you to see without bubble obstruction while the boat is underway at top speeds. These two windows make it easy to locate reefs or wrecks and cost \$450.

An option that only recently became available is an extended center seating area with storage for eight tanks and seating on either side. This is at just the right height for sitting down and slipping into a tank backpack. This option costs about \$100. Of course, if you prefer, you can add standard tank racks to the gunwales, or a forward recessed center tank rack that holds four to six tanks.

The Dolphin Boat people are quite open to suggestions and can install just about any option you can think up, as long as it does not alter the safe operation of the boat.

One of the best options about buying a Super Dolphin is that you will get to travel south to order it and will have an opportunity to dive off the Florida Keys. Since you will not have to pay a dealer, this becomes a very attractive option.

For additional specifications or information write to: Dolphin 20' Boats, Inc., P.O. Box 1401, Homestead, FL 33030 or call (305) 248-9668. If you are planning to be in the Florida Keys area you can see the Super Dolphin at 161 S.W. 4th Avenue, Homestead.



**The Super Dolphin can be ordered with outboard, stern drive or jet drive power. A center console is standard but a side console model is available. Plenty of storage is included and the boat will accommodate four divers with full gear.**

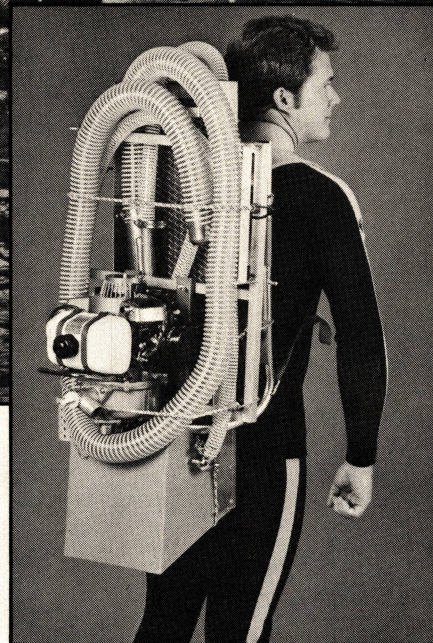




photo/Jim Walker

# BACKPACKER TE-2000S

Treasure Emporium's Powerful Portable By Jim Walker



A portable gold dredge can infect a diver with a special type of fever. After just a few hours of using one you find yourself analyzing each body of water you see for its potential as a source of gold. You imagine yourself, suction hose in hand, submerged in everything from sheltered ocean coves to small mountain streams. Flooding, which you once cursed for ruining your underwater visibility, now becomes your partner as it uncovers new deposits of precious metal.

Treasure Emporium of Sylmar, California makes a dredge which can satisfy (or cause) your gold hunting fever. The Backpacker (TE-2000S), as the name indicates, fits on a standard aluminum pack frame. It weighs only 36 pounds. Its two inch diameter suction hose and 1.2 hp FujiRobin two cycle engine/pump combine to move up to 35 gallons of water per minute. This translates into moving up to two cubic yards of gravel per hour.

Moving a lot of sediment through your riffle box is important, but what is retained is even more important. The Backpacker has a sluice box made of corrosion resistant aluminum sheeting. It measures 34x10x3 inches. The riffles themselves are made of cadmium coated steel and the whole series can be raised as a unit (hinged at the top) to uncover the floor of the box. There are two types of riffles in the Backpacker. Water entering the sluice first passes over four standard (Hungarian-style) partitions and then over two, stacked steel screens. Both the upper and lower screens have diamond shaped (expanded steel) perforations but the lower screen has smaller holes. The bottom of the riffle box is lined with a pad made of looped fibers which forms an extremely efficient trap for small, heavy particles.

The head of the riffle box is covered with an orange Marlex hood. Water

shooting up from the suction hose is directed down into the riffles by the hood and its attached splash guard made of indoor-outdoor carpeting. The face of the hood has a plug which can be removed, allowing a rod to be inserted through the hood and into the suction hose to tap out occasional clogs—a handy feature.

The Backpacker's engine has a spark arresting muffler and can be operated for eight hours on each gallon of gas. The cast aluminum pump is built into the engine and has four openings. At the top is the prime opening, fitted with a threaded nylon plug. A similar plug seals the drain at the bottom of the plump. Two threaded male extensions serve as the intake and exit from the pump. Couplers inserted into the appropriate hoses and secured there with clamps can be quickly screwed on and off these extensions by hand—another handy feature.

All hoses on the Backpacker dredge



are made of clear vinyl reinforced with coils of white plastic. The main suction hose is eight feet long, allowing the diver/pro prospector to dredge in water of that depth or shallower.

A three foot hose (one inch diameter) connects the pump to the intake strainer, a gray plastic canister. Perforated by one-quarter inch diameter holes, it will keep gravel particles larger than the holes from entering the pump. (As an added precaution, the strainer should be placed in a bucket when the dredge is operated where the intake can touch bottom.) Another one inch diameter (jet) hose carries the water pushed by the pump to the suction hose.

The Backpacker has the junction unit

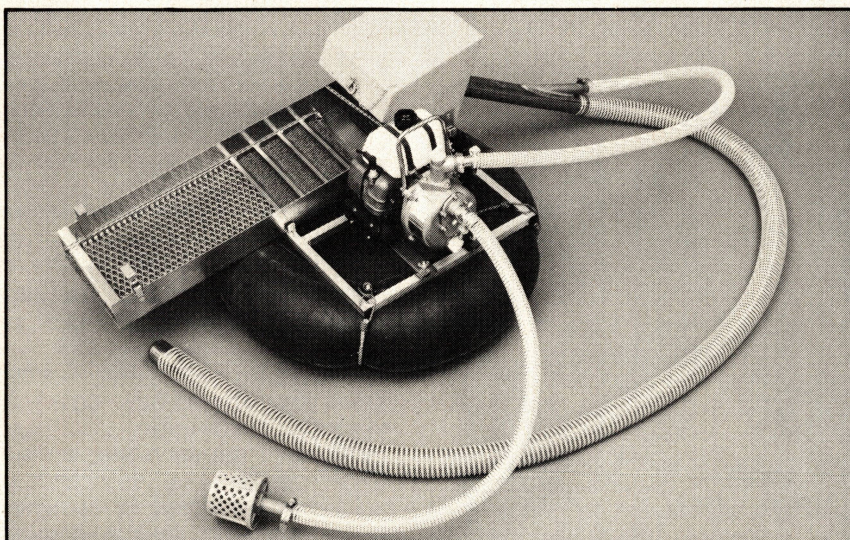
tion hose allows the use of a smaller intake nozzle. The nozzle is simply a three inch long section of two inch diameter steel tubing inserted in the hose. The opening of the nozzle is narrowed to keep out larger rocks.

The engine/pump and riffle box are supported by a 21 by 18 inch frame of square aluminum tubing permanently welded together. While this does create a slightly larger package to carry than would a collapsible frame, it greatly simplifies set-up. The engine is secured to the frame by four steel bolts with wing nuts, and the riffle box rests on, and between, brackets welded to the frame. Adjustment of the box on the frame is accomplished by sliding the box back

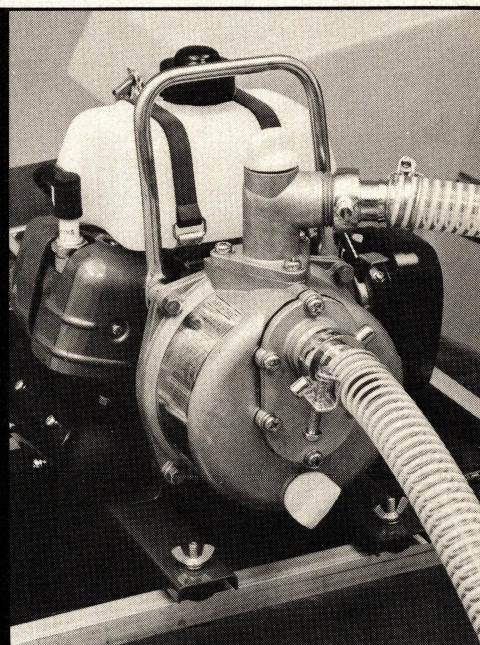
hose. The riffles did their job adequately and the packed system was reasonably comfortable to carry.

Depending on current, position of the suction hose, amount of sediment and water in the riffle box, etc., the balance of the dredge can shift. This must be compensated for by adjusting the position of the box and by anchoring the dredge to a stationary object with a length of rope.

Care of the Backpacker is fairly simple. Maintain the proper oil-to-gas fuel mixture, keep the pump primed whenever the engine is running, and keep sand from entering the pump intake. Run the pump with clean water after use and rinse the entire system with fresh water after use in the ocean. Keep your inner tube



**Treasure Emporium's TE-2000S dredge weighs just 36 pounds and is carried on a backpack. Its two inch diameter suction hose and 1.2 hp FujiRobin engine/pump can move two cubic yards of gravel per hour in even the most remote locations.**




of the suction and jet hoses inserted into the head of the riffle box. This junction is a 20 inch long Y-shaped connector made of cadmium coated steel. The jet hose attaches to the smaller branch (eductor) of the connector and the suction hose attaches to the larger branch. Water from the jet hose shoots through the connector directly into the riffle box. The suction thus created in the larger branch of the connector pulls water and sediment up through the main hose and into the riffle box. This arrangement has two advantages over other dredges with the junction at the intake nozzle of the suction hose: First, since the diver only has to carry one hose, positioning it is easier. Second, if a clog occurs in the suction hose below the Y-connector, the flow from the pump is not restricted. This prevents unnecessary strain on the pump caused by cavitation. Additionally, the lack of a junction at the intake of the suc-

and forth between the brackets. An elastic bungee cord holds the box in the desired position.

The frame and attached machinery float on an inflated truck inner tube. Four bungee cords wrap around the tube and secure the frame at each corner. These same cords secure the dredge to the pack when the system is transported. Ample space is left in the packed configuration for carrying a one gallon gas can.

While testing the Backpacker the simplicity of its design became apparent. The unencumbered suction hose and small nozzle could poke into crevices which would be hard to reach with other dredges. And, the entire system could be assembled or disassembled in moments using only bare hands and one or two applications of a screwdriver. The pump would push water over the riffles at the lowest of rpms, but more power was required to pull the sediment up the suction

away from sharp objects. Take care not to put strain on the Y-connector on the suction hose. It is held in position by the Marlex riffle hood and could rip out.

The Backpacker portable gold dredge is light enough to carry into remote locations and powerful enough to make the trip worthwhile. Its sturdy construction and simple design seem well suited for use in the outdoors. The FujiRobin engine/pump carries a one year limited warranty and Treasure Emporium gives a limited one year warranty on the rest of the machinery. The complete dredge with instructions and a basic tool kit retails for \$499.95. The backpack costs \$30. Treasure Emporium also stocks a variety of larger dredges, accessories, and books on rock hounding, treasure hunting and other topics. For more information contact: Treasure Emporium, 12823 Foothill Blvd., Sylmar, CA 91342; (213) 361-7126. 



# SEAPRO'S

## SEACOMP DIGITAL DIVE CONSOLE

TEXT AND PHOTOGRAPHY  
BY GERI MURPHY

**T**he Seacomp is the newest member of a very exotic generation of dive instrument consoles which combines micro-electronics with brightly glowing digital displays. Technically known as a Computer Assisted Diving Instrument (CADI), the Seacomp was developed and manufactured by Newtec Industries of Canada.

As with standard instrument consoles, the Seacomp provides the diver with a continuous flow of information. But, the data is generated electronically and presented in numerical form. Light Emitting Diodes (LED's) are an impressive display with bright red glowing numbers and dots which can be viewed both in daylight or total darkness. In addition to the standard information, the Seacomp has its own calculator which automatically computes any decompression.

The Seacomp looks something like an oversized instrument console with a rubber boot that absorbs bumps and bangs. Beneath the rubber there is a two part plastic housing sealed with an O-ring. The upper portion is a clear polycarbonate which allows the user to read the digital display boards inside. The lower half is rugged ABS plastic for durability and extra strength around the high pressure hose fitting.

The entire electronic package is powered by a standard nine volt alkaline battery. The manufacturer claims the battery will last up to 54 hours. An energy saving mercury switch inside automatically shuts off the LED display when the console is hung upside down. Although the lights may be out, the central core of the computer and its sensors continue operating.

The Seacomp is designed to be activated prior to the first dive. The battery is inserted in the bottom of the console and the locking cap twisted clockwise to make contact. Aside from this, there are no switches, buttons or dials to operate — the Seacomp operates automatically. It remains in the On position for the entire diving day, keeping track of depths, bottom time and surface intervals.

The Seacomp provides a con-

tinuous flow of information on four different functions during the dive:

1) It gives the tank pressure in increments of hundreds of psi. A figure of 13 would indicate 1300 psi. 2) It shows the current depth and, 3) the maximum depth in feet of seawater (fsw). These latter numbers alternate. The maximum depth is easily recognized as the greater of the two numbers. 4) It records the total bottom time in minutes, starting when the diver descends to five feet and stopping

when the diver ascends above five feet.

Perhaps the most unique feature of the Seacomp is its highly simplified decompression calculator. The device is entirely computerized and automatically keeps track of bottom times at various depths plus surface intervals.

Decompression status is indicated by a simplified bar graph. A series of flashing lights appear in five separate squares that run across the face of the console from left to right. Each of the five squares indicates the depth level to which a diver can ascend without decompressing. They line up with an information graph directly below. The interesting feature of this system is that it takes into consideration altitudes (5000 and 10,000 feet) to which a diver can ascend after the dive. It can be a very handy device for the diver who will be flying a few hours after the last dive.


The decompression program in the Seacomp is not based on the U.S. Navy dive tables. Instead, it is programmed after the Kidd-Stubbs model developed by the Canadian Defense and Civil Institute of Environmental Medicine. It is a continuous curve decompression table based on four separate tissue half-times in the diver's body. This system has been around for more than 10 years and has been tested by both the Royal Canadian and the British navies. The application of the Kidd-Stubbs tables in the Seacomp is so simplified that the user does not need to calculate residual nitrogen times or repetitive group designations. The console simply indicates when it is safe to ascend to the next level, automatically.

Divers should not be misled by the term automatic decompression meter. The Seacomp is a highly sophisticated instrument designed for the advanced or experienced scuba diver who has a full understanding of decompression theory and repetitive dive calculation. The unit retails for \$750 at professional dive stores.

For more information about the Seacomp, write to: Bill Walters, Seapro Inc., 18030 So. Euclid St., Fountain Valley, CA 92708.

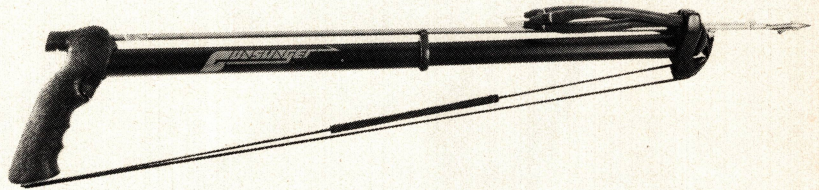






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for the pistol packing shooter

# THE GUNSLINGER



## TEXT AND PHOTOGRAPHY BY HOWARD HALL

**K**iss Enterprises' Gunslinger is 18 inches long and clips into an eight inch plastic holster strapped to the thigh. During most of your dive you can swim comfortably with both hands free. Then, when you need it, you can draw the Gunslinger and, with a few practiced movements, have a powerful three foot, double sling speargun which carries the impact of a 32 inch shaft. After firing, the Gunslinger can be quickly collapsed and holstered.

When collapsed, the Gunslinger's shaft is separated into two parts and the barrel is telescoped down to its 18 inch position. Then the speargun is simply pressed into the holster clip. A Velcro safety strap on the holster secures the gun in place. The holster attaches to the thigh with nylon straps.

Kiss Enterprises says that it takes less than 60 seconds to draw, assemble and load its weapon underwater. Indeed, I found that with only ten minutes practice, I could draw and have the Gunslinger ready to fire in just over 30 seconds. To assemble the Gunslinger, you press a button on the barrel which allows it to telescope out to one of three power positions, freeing the front half of the spear shaft. This section of the shaft is then threaded into the rear section which is already mounted in the firing mechanism. The leader line is reattached to the line release mechanism and the gun is ready to load.

Not only is the Gunslinger's collapsible design unique, but Kiss Enterprises has included numerous other design innovations. The telescoping barrel of the Gunslinger is made of hard anodized aluminum. When extended, the forward half of the barrel contains a sealed air space which buoys the gun for balanced handling.

There are three different positions for the barrel as it is telescoped out. The furthest position provides maximum power.

The other two positions provide decreased power and increased ease of loading the rubber slings. The barrel is locked into position by a spring loaded pin. The muzzle at the end of the barrel has individual grooves for each rubber sling. These prevent the slings from becoming tangled and simplify loading. The muzzle also has a hole which encases the speartip when the gun is in the collapsed position. This prevents damage to and by the tip when the gun is not in use.


The Gunslinger's spearshaft is heavy, three-eighths inch diameter stainless steel. Kiss Enterprises has provided an extension guide at the threaded joint which allows the two pieces to slip together securely before threading. This minor feature saves considerable time in assembly.

The speartip is a twin barb design with a rock point. It has a guide ring for holding the barbs down when removing the shaft from a speared fish. This is perhaps the most popular tip design for all-around spearfishing.

Most speargun shafts have notches cut to hold the slings when the gun is loaded. The manufacturers of the Gunslinger have significantly improved on this design. The spear shaft has a band hook behind which both rubber slings are engaged. This has three advantages over notches. First: It does not decrease the strength of the shaft as will notches. Second: Since both rubber slings attach as far back as possible, sling power is maximized. Third: The band hook allows the slings to pull perfectly parallel to the shaft. This more efficiently transfers power to the shaft and minimizes the drag of the shaft against the barrel. When the gun is fired, the band hook folds flat against the shaft, further reducing drag.

The handgrip on the Gunslinger is also unique. It is made of heavy duty plastic with a rough "sure grip" surface. Both the trigger and the safety lie under your index finger. Kiss Enterprises calls the firing mechanism the "Push Trigger" and "Sure Wedge Safety." When on, the safety actually wedges the trigger in the non-fire position. The firing sequence can easily be accomplished by feel and without moving the palm of your hand on the grip. First, the safety is disengaged by pushing it with the thumb. Next, the trigger is pushed over into the firing position. Then the trigger is squeezed to fire.

Although this firing sequence requires three movements (some of which can certainly be made well ahead of actually aiming), it can be accomplished swiftly.

The Gunslinger will soon be available in dive stores for \$120. For more information contact: Kiss Enterprises, 350 N. Latana, Suite 505, Camarillo, CA 93010; (805) 484-7410. 



# Scubapro's New **LIGHTNING JET FINS**



Except for the logo, Lightning Jet fins look just like the company's familiar Jet Fins. The new fins are made of a lighter, more flexible rubber compound.

**BY BONNIE J. CARDONE**

lighter than the old ones, but holding a pair of the old ones in one hand and a pair of new ones in the other, I couldn't tell the difference. Indeed, this amounts to only a few ounces. An average pair of the new, super extra large fins weighs about 11 ounces less than the old; the regular, about 8 ounces less; and the small, about 7 ounces less.

In the water, however, there is a noticeable difference. The new fins are more flexible: Although this difference is subtle, I found them easier to dive with. And, instead of being negative, as are the old fins, the Lightning Fins are neutrally buoyant. They won't float, however, because of the weight of the brass hardware for the straps.

Jet Fins have always been very popular and I wondered why any company would tinker with a product that was selling well, performing well and lasting practically forever. According to a Scubapro spokesman there were two main reasons, one having to do with performance and the other with cost. Lightning Fins are made of natural rubber and neoprene, as are the old Jet Fins. The compound used just has a different formulation: One that has been used solely for Scubapro's floating fins in the past. The new compound is slightly lighter, making the fins easier to use and more energy-efficient. It is also slightly less expensive. By switching compounds, Scubapro was able to keep the price of the fins from skyrocketing — improving performance without sacrificing longevity in the process. The smallest pair of Lightning Jets (shoe sizes 4 to 9) retails for about \$40; the regular (7 to 11), \$42; and the super extra large (10 to 14), \$51.

Well, I tried the Lightning Jet Fins and I like them. If you're a Jet Fin *aficionado*, I'm sure you will, too. Even if you're not a Jet Fin fan, why don't you take a look at a pair next time you're in a dive shop? You just might become a Jet Fin convert! ➤

**L**ooking at the ad announcing Scubapro's new Lightning Jet Fin, I was intrigued. My nine year old Jets are the first and only pair of fins I have ever owned, and I have been more than satisfied with their performance. How, I wondered, could they be improved? Would I like the new ones better?

I ordered a pair and examined them carefully when they arrived. They didn't look any different than my old Jet Fins and, in appearance, they aren't. The same molds are used to make the fins, only the material poured into them is different.

The new fins are supposed to be



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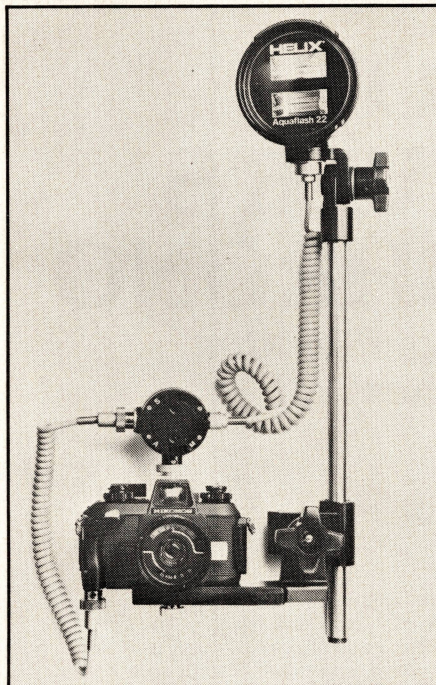
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# Rx FOR DIVERS

BY FRED BOVE, M.D., Ph.D.

A frequently asked question concerns age limits for diving. In commercial and military diving there are age restrictions because of the extreme conditions sometimes encountered. For sport scuba diving we need to consider upper and lower age limits. Many of the certification organizations have lower age limits of around 15. However, there are no data which indicate diving is harmful to youngsters. The prime concern is whether there is the judgment and maturity needed to dive safely. Well-motivated children, properly trained and supervised, can dive earlier but they require special attention. One instructor I know taught his nine year-old son, and they were ocean diving together when his son was eleven. Although we do not recommend training pre-teen children to dive, the reasons for excluding them are based on maturity and judgment; there is no physiological reason other than lack of strength and occasional exceptions can be made.

A more frequent problem is deciding upon an upper age limit. As our understanding of the aging process improves, it seems that much of what we perceive of as aging is actually the result of a lack of physical activity. Older individuals who maintain a good physical condition often have surprising abilities when it comes to sports like scuba. Granted, age does reduce our ability to perform physically, but this can be minimized by a life-long commitment to keeping fit. It is more important to determine a person's physical capacity and general health (not age) when deciding whether diving is acceptable. If your health is good, you are in reasonable physical shape, and you want to dive, do not let age alone be your limitation. Dive conditions and environments can be found that fit your individual capacity.

Let's say you are 63 years old (male or female) and after your Caribbean



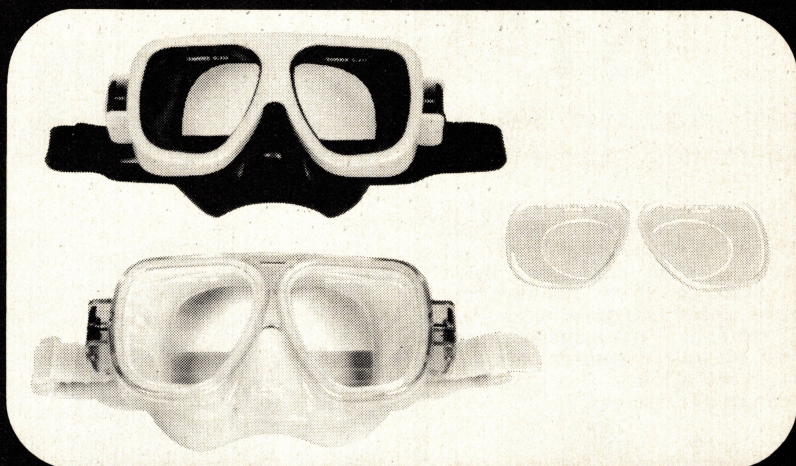
vacation spent sitting on the beach looking at the surface of the blue water and listening to the dive chatter, you decide to look into a scuba course. Start by a visit to your doctor for an evaluation, including an exercise stress test to measure your physical capacity. Unless you know a doctor familiar with diving, be ready for statements about being too old, about the dangers of diving (sharks, giant squid, bends, etc.), and about being eccentric. You can choose to counter each of these criticisms, but sometimes it is better to agree and generate a slight air of mystery. Whatever the circumstance, you should be in good general health and your stress test should show that you have fair exercise tolerance. You should be able to handle eight to ten MET's (a measure of exercise capacity). If your physical condition is not adequate, then your first goal is to get in better shape (conditioning programs will be the topic for next month).

What has occurred thus far may take six to eight months. For example — say that your winter vacation is followed by the decision to learn scuba. A physical examination in spring shows the need for physical conditioning. Plan on a six month training period through spring and summer, then a fall scuba course either at home or perhaps while on vacation. When selecting a scuba training program, find one that includes other adults. A course for the high school aquatics team may not suit your physical capacity, and good scuba instructors will design their training program to fit the students in the class. Remember also that a full certification course given over six or seven intense days at a resort may require more physical and mental effort than you want to expend. Courses spread over eight to ten weeks give you more time to train and learn the theoretical aspects.

## RESPONSES

C. H. Roberts asked about diving after surgery for removal of an aortic aneurysm, a swelling of the main artery of the body. As with any surgery, there must be an adequate recovery period to allow healing to occur. Remember, surgical scars may make you more susceptible to decompression sickness, so your diving should be done conservatively. The physical exercise needed in diving — lifting tanks, climbing, swimming — can place stress on surgical incisions, so they should be well healed before diving. You should work to improve your physical conditioning as well. One concern for Roberts is that atherosclerosis of the aorta requiring surgical repair is often associated with this disease in other arteries. Clearance by your doctor should be obtained before returning to activity. Your ability to dive will depend both on the results of the surgery and the status of the other arteries.

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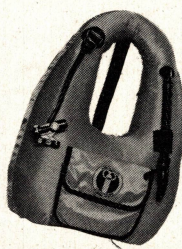
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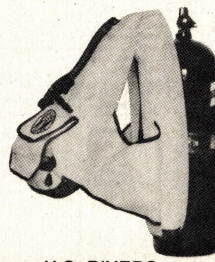
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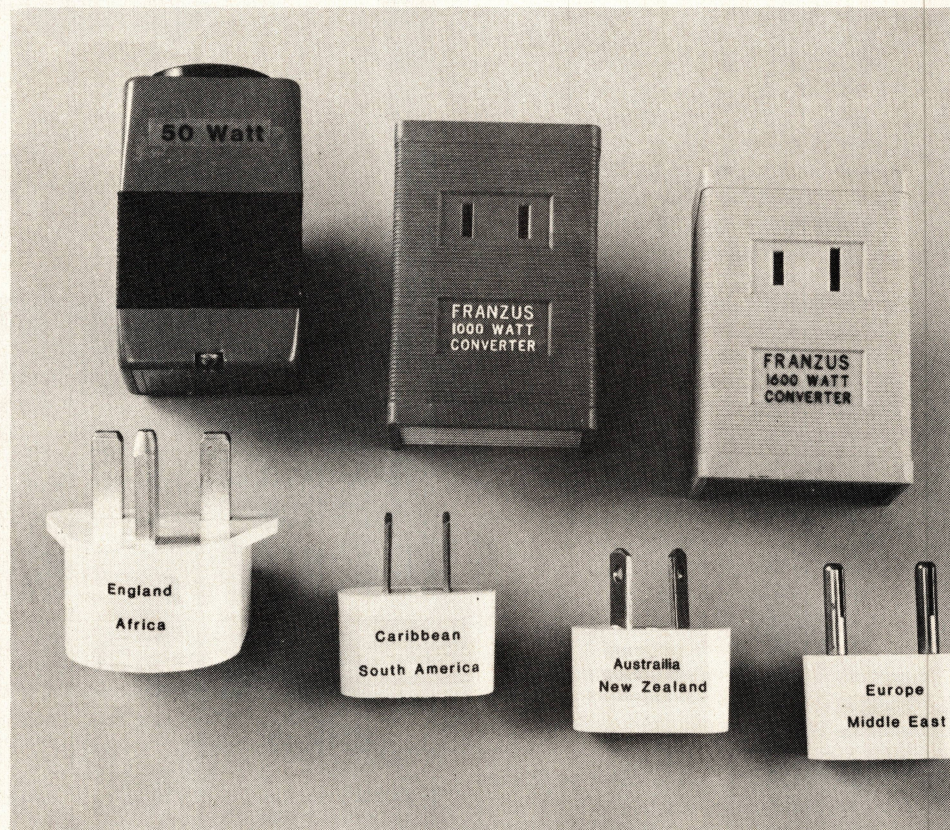
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# TURN ON WORLDWIDE



## With Franzus Electrical Converters and Adapters

Text and photography by Geri Murphy

The recent boom in overseas dive travel has brought with it a whole new set of electrical problems. Divers bring their favorite personal appliances, such as hair dryers, electric shavers, irons and tape players. More important, they have electrical devices, such as lights and strobes, which need charging. In some countries, using appliances and battery chargers could be difficult if not impossible. Electrical outlets in many foreign countries take a different shaped or sized plug than we are used to. Some have round holes while others have V-shaped slots or triple slots arranged in an unfamiliar pattern. These outlets will not accept American made plugs. Also, in the U.S., the standard power for most home appliances is 110 volt 60 cycle alternating current (AC). However, many foreign countries have 220 volt, 50 cycle alternating current. In some areas there could be as much as 240 or as little as 110 volts. Voltage can vary

from country to country. If you are unfortunate enough to plug a 110 volt appliance into a 220 volt outlet, chances are you will burn out, melt or otherwise ruin the appliance.

In order to utilize foreign power, you must find a way to adapt your American made plug to foreign outlets. This is where the Franzus Company of New York City comes in. This firm specializes in the design and production of electrical adapters and voltage converters.

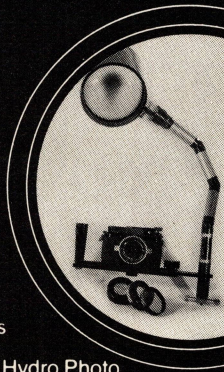
American made electrical plugs have two flat, parallel, metal blades. Franzus has developed a set of four plugs which will fit on your appliance plug and adapt it to almost any type of foreign outlet. The continental adapter has two long, round pins and is specifically designed to fit the type of outlets found in Austria, Germany, Switzerland and parts of Africa. Another adapter features two flat blades arranged in a V-shaped angle and will fit outlets found in Australia and New



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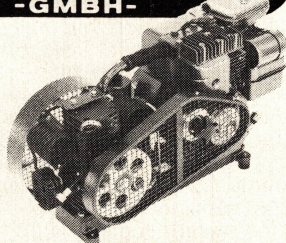
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Zealand. The British adapter has three flat blades at three different angles and will fit outlets found in England and some parts of Africa. There is also an adapter with two flat parallel blades for outlets found in South America and some areas of the Caribbean.

The adapter plugs can be used in one of two ways. If the current is 110 volts (same as U.S.) the plug can be attached directly to the electrical cord of the appliance. However, if you suspect the voltage may be 220 or 240 volts, the adapter plug must be attached to a voltage converter which is, in turn, attached to your appliance.

In years past, the job of converting electricity from one voltage to another required a bulky step-down transformer that weighed 5 to 15 pounds. Fortunately, the new age of solid state electronics has made these old style transformers almost obsolete. Franzus makes voltage converters which measure three inches in length and only weigh three to ten ounces. These featherweight units are easy to use and ideal for travel.

Franzus presently makes three voltage converters. Each has a different wattage capacity. Wattage is the amount of electricity your appliance uses, while voltage simply indicates the rate of flow. The wattage of every U.S. manufactured appliance is clearly marked somewhere on the appliance itself and you must select a voltage converter that matches the wattage of the appliance.

The Franzus #1600 converter is designed specifically for use with very high wattage appliances such as heavy-duty hair dryers, electric shavers, irons and hair curlers. This model will handle up to 1600 watts.

The Franzus #1821 converter is designed for medium range appliances up to a maximum capacity of 1000 watts. This device is for use with electrical devices in the 700 to 1000 watt range.

The Franzus #F-11 converter is designed specifically for equipment ranging from 1 to 50 watts. It works perfectly with battery chargers, portable radios and cassette tape players. This is the model most traveling divers need.

Armed with a set of Franzus adapter plugs and voltage converters, a diver can go almost anywhere in the world and use foreign electricity for his or her personal needs. The set of four adapter plugs sells in most stores for only \$6.95. The voltage converters can range in price from \$12.95 to \$15.95 each, depending on which model is selected. Franzus even offers a package deal containing two converters and four adapters for \$32.95. These items can be found in luggage shops, hardware, department and some large drug stores.

For more information and a brochure, write to the Franzus Company, 352 Park Avenue South, New York, NY 10010.

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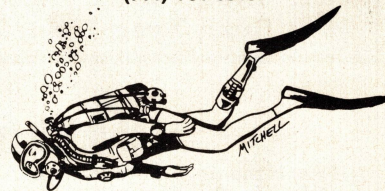
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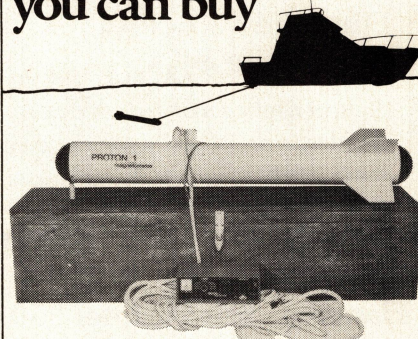
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Now is the time for that trip to Australia - let OceanQuest make complete airline, land and boat arrangements. Dive In Australia offers Reef Explorer Cruises aboard TSMV Reef Explorer, M.V. Auriga Bay and M.V. Bali Hai II with departures from Cairns; Divemaster and Reefseeker with departures from Townsville; as well as the land based Heron Island package.

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## **Dive Travel™**

By Amy Brown

### **"One-Stop Reservations" Bring Non Stop Convenience**

OceanQuest, a unique, full-service firm is revolutionizing dive travel - by making it easier than ever before.

Until recently, the majority of divers who travel independently have had to gather information and make their reservations piecemeal: Resorts are not equipped to handle flight reservations, and most travel agents, although helpful, cannot provide specific answers to the usual range of diver's queries: offshore diving? depth of reefs? availability of photographic facilities? Naturally, for group organizers, the problems -- and headaches -- were compounded.

OceanQuest provides a complete reservations system. A company designed exclusively to meet the needs of travelling divers, OceanQuest has already gained a solid reputation for its professional level of service.

For example, OceanQuest's on-line computerized reservations system enables its agents to provide worldwide flight itineraries and availabilities for more than 100,000 city pairs served by some 500 airlines here and abroad. And, with toll-free Wats lines, information is literally just a phone call away. Additional services make dive travel truly headache free: knowledgeable agents book the best flight available, reserve your complete dive package, issue your tickets, prepare your vouchers, plus answer your questions.

Equally as important, OceanQuest carefully researches resorts and works closely with them to design competitively priced packages that offer the best value for desirable destinations. Among the finest are Spanish Cove, one of the most modern dive facilities on Grand Cayman, complimented by comfortable accommodations and excellent meals; and the Tropic Bird motor yacht in the British Virgin Islands, a live aboard dive vessel with the comforts and amenities of a land based operation.

OceanQuest meets a real need: It permits divers to concentrate on the essentials -- enjoying some of the world's most spectacular diving. A swelling tide of satisfied clients ensures that it will continue to make a big splash.

**For Dive/Travel to the best destinations in the world contact OceanQuest, Inc., 139 Woodlawn Avenue, Upper Montclair, New Jersey 07043 or call toll free 800/526-1394 or 201/744-5254.**

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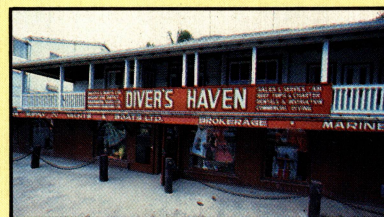
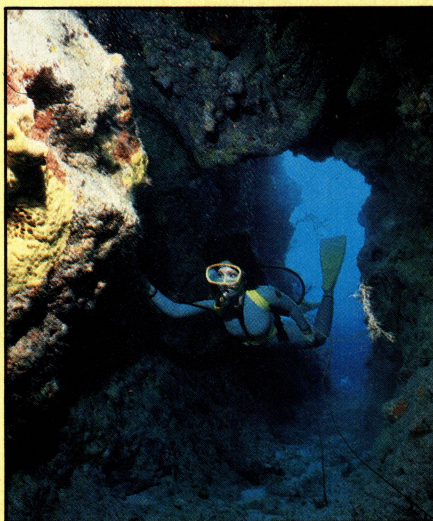
# SDM travel

## SECTION

**A**lmost in the middle of that jade and emerald universe known as the Bahamas, is Nassau. On the island of New Providence, Nassau, among other things, is the seat of the government and the country's major shipping port. Nearly 60 percent of the entire Bahamian population resides in this metropolitan area and it hosts more than a million tourists a year. The city and surrounding countryside feature many luxury hotels, deluxe high-rises and splendid villas with accompanying white sand beaches and tropical gardens. There are plush gambling casinos, attractive night clubs, large marinas, dozens of tennis courts and several excellent golf courses. Activities include buggy rides along historic routes, shopping at the world's largest straw market, and a tour of several old British fortresses. Experienced travelers will tell you that Nassau also has the best free port shopping, the wildest parades, and the snappiest night life of any of the Bahamas' 700 islands.

Nassau is also a great place for diving if you can find the right kind of help in getting to the special sites.

Fortunately you can find the help you need at Diver's Haven — an operation which encompasses Nassau Dive Supply, Underwater Tours and Underwater Engineering. Nassau Dive Supply is conveniently located on East Bay Street, right on the waterfront, next to the Pilot House Hotel and across the street from the Yacht Haven Marina. This is a certified PADI training facility and an authorized dealer for Dacor, U.S. Divers and Scubapro. The full service store features complete sales, rental and repair and carries a fine selection of dive accessories, swimwear, inflatable boats and outboard motors. Behind the store is a 22 by 36 foot freshwater pool. The dive boats are berthed



## NASSAU Something For Everyone

Text and photography  
by Rick Frehsee

across the street at the marina, and that's where U/W Tours comes in.

Underwater Tours has maintained a perfect safety record for its dive trips since the early 1960's. The staggering figures of 120,000 divers and 15,000 reef trips attest to the fact that it is the largest and most experienced charter operation in the Bahamas. There are four air compressors, more than 100 scuba tanks and four dive boats. The largest vessel is a 65 foot converted ferry which can carry large groups of snorkelers or scuba divers to the better traveled reefs. For advanced divers, there are four Formula boats — three 23 footers and one 26 footer — which will get you into some special Nassau diving. These can be chartered reasonably by small groups for



a two tank/half day package.

Nassau Dive Supply and Underwater Tours work in combination and complement each other as do their married partners Fran and Gardner Young. Fran is a small and energetic blonde who, before diving, was an airline hostess and a water ballet performer. She is a PADI master instructor, a licensed boat captain, an equipment repair specialist and an underwater model who doubled for James Bond's girlfriend in *For Your Eyes Only*. Fran is in charge of the



store and is the divemaster for the specialty courses and charters. With the freshwater pool behind the store and the bevy of Formula boats at her disposal, Fran is the key to advanced diving in Nassau.

Gardner Young is Fran's physical opposite. He is big, with a 20 year tan and a voice that is one octave lower than a foghorn. Twenty years ago he and Charlie Badeau, who is still with the company, started Underwater Tours. When Gardner wasn't guiding trips or tours he was diving commercially throughout the Bahamas. And, when he wasn't doing either, he was contracted to work behind the scenes or on-camera on some of Hollywood's most memorable under-sea television and motion picture productions. Included in his credits are several James Bond movies and the original Sea Hunt TV series with Lloyd Bridges. Gardner's major responsibility with Underwater Tours today is the organization of the boats and guides that serve the diving public.

#### **EAST NASSAU DIVING**

Nassau/New Providence is a fair sized island (80 square miles) which

is surrounded by fringing coral reefs with many smaller islets and cays nearby. There are plenty of shallow reefs, a couple of interesting wrecks and literally miles of impressive wall diving within an hour's reach. A couple of hours in one of Underwater Tours' fast Formulas will get you some really spectacular dives including a trip to the Exumas, one of the least explored island groups in the Bahamas. Taking short trips to the reefs and wrecks east of Nassau Harbor is a good way to start your personal discovery of Nassau diving. This area includes Paradise Island, Cat Cay, Green Cay, Rose Island, Athol Island and Porgee Rocks. All these spots have numerous shallow reef formations and many cuts and lagoons to explore. Take a lunch along and anchor just off one of the smaller cays. The following is a rundown of popular locations to the east of Nassau:

Paradise Island and Green Cay reefs are typical shallow reef formations that are crowded with staghorn and elkhorn coral and harbor most of the common reef fishes.

The LCT Wreck is a sunken World War II landing craft a few miles east of Nassau off the eastern tip of Athol



Island. It rests in 15 feet of water with part of the superstructure awash. It is often called the *Thunderball* wreck because it was used in the James



***That can't be Jack...***

***I didn't even think  
he knew how to swim!***

***Looks like he knows  
more than we thought...***





Bond movie of the same name. The LCT is suitable for snorkeling, fish watching and macro photography.

A better wreck dive is the 200 foot

long *Mahoney*, only one-half mile out from Paradise Island. The *Mahoney* was never the *Mahoney* until it became a shipwreck. Why it has that

name today is a mystery. Built in 1880, it was a private yacht, the *Candace*, owned by an English millionaire. In passing years she was sold several times and re-named the *Firequeen* by the British Admiralty and *Firebird* by the Imperial Lighthouse Commission. On her way to being scrapped she broke tow and settled to the bottom in 30 feet of water. She has been dynamited several times by salvage crews and is pretty well broken up and scattered across the flat sand bottom. A separate, deeper section, sometimes called the *Deep Mahoney*, lies about 150 feet away and is usually frequented by large grouper and snapper.

The Lost Ocean Hole, on the bank five miles east of Nassau, is a strange experience. This large blue hole has an opening at 30 feet which drops nearly straight down to 180 feet. Gardner Young discovered this blue hole and for many years it was his private dive site. The rim of the opening is decorated with large head corals and is often patrolled by jacks, 'cuda and permit. Although the opening is only 40 feet in diameter, inside it widens abruptly like an inverted funnel.

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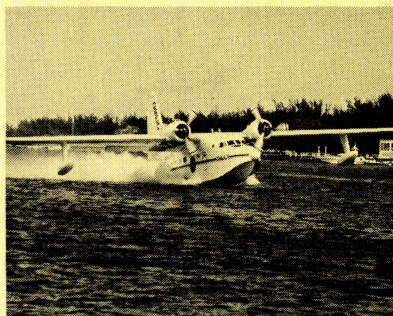
## WEST NASSAU DIVING

The most spectacular and least visited dive sites are west of Nassau and a little farther away. They are well worth a special charter and include some really wild wall dives and crystal visibility. In fact, there are miles of drop-offs all along the north, northwest and western shore of New Providence Island starting in 40 to 100 feet of water. Fish life along this deep shelf is generally more impressive than those dive sites east of Nassau. The following are the most popular dives:

Gambier Reef is named for the nearby village which is easily sited from shore. Here, about 1800 yards from the shoreline, is a drop-off which begins in 100 feet of water. The section leading to the dropoff is the most spectacular and features a densely populated deep reef in 80 feet of water with heavy dome and star corals and an impressive fish population.

The most famous wall dive in the Nassau area is the Lyford Cay Drop-off. Floating off this precipice is like a fantasy trip through blue inner-space. The top of the wall is at 45 feet, then the wall plummets vertically to thousands of feet. The face is sheer, even

undercut in places, and there are several caves and caverns through the wall. The vertical escarpment is decorated with colorful sponges, delicate hydrozoans, large deepwater fans, slender wire corals and trees of black coral. Large pelagic fish are often sighted. A short distance to the west is Lambton Wall, a similar formation with many caves, caverns and tunnels. Goulding Cay reefs feature a more extensive shallow formation



and a gently sloping wall teeming with marine life.

Because of the fast boats available from Underwater Tours, one day trips to the Exumas are possible. Here you

can practically name your own dive pleasures as there are numerous cays and dive sites that feature stunning staghorn reefs and remarkable fish populations.

## GETTING THERE

For the most fun in getting to Nassau I recommend that you fly with Chalks Seaplane Service. The planes take off from the waters off Watson Island near downtown Miami and land a short time later in Nassau Harbor. Chalks is an institution in this part of the world and one of the first airlines founded in the U.S. It has a perfect safety record and I have been happily flying to the Bahamas with Chalks for nearly 15 years.

Sometimes we overlook the obvious. Nassau is the gateway to the Bahamas. It can be appreciated by snorkel-divers as well as divers. A visit with Fran and Gardner will prove that. They can also recommend and/or make reservations for guest houses or hotels to complete your vacation.

For more information contact Diver's Haven at Box N1658, Nassau, Bahamas; or phone (809) 322-4869/23285.

# Sun, Sea & Sand

Come to the magical islands of endless summer and happy people. Sun drenched beaches and virgin reefs await your exploration. Big fish and lobsters are still plentiful, and our living corals are untouched by industrial pollution. Snorkel over our sea fan gardens... discover our historical shipwrecks... visit our magnificent ocean blue holes... and thrill over the spectacular beauty of our vertical drop-offs.

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Miami, Florida 33139

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## LA MER TO GALAPAGOS

La Mer Diving Seafari has developed a live-aboard dive program to the Galapagos Islands, 600 miles west of Ecuador.

The program will include 18 days exploring the islands. After a day in Quito, Ecuador participants will fly to Baltra Island and board the 70 foot staysail motor schooner, *Encantada*, which is fully equipped for diving. Each group will be accompanied by a divemaster and a local naturalist guide. There will be one to two dives daily, snorkeling, and excursions ashore. The group will visit the islands of Isabella, Fernandina, Santa Cruz, Hood, Gardner and others.

For further information write: La Mer Diving Seafari, Inc., 823 UN Plaza, Suite 810, New York, NY 10017.

## SOTO'S PACKAGES

A complete and comprehensive catalogue of 12 group dive packages has been developed by Ronald Kipp, president of Bob Soto's Diving Limited, Grand Cayman. Three boats are available: the *Holiday Diver* (35 divers), the *Reef Diver* (22 divers) and the *Paradise Diver* (15 divers). Four packages ranging from 12 full days of diving (17 tanks) to five afternoon photo dives and a night dive (six tanks) can be scheduled on any of the boats. Unlimited shore diving can be added to any program.

For additional information write: Bob Soto's Diving Limited, P.O. Box 1801, Grand Cayman, British West Indies or call (809) 949-2483.

## SPANISH COVE

Spanish Cove, has 23 rooms, including 10 individual villas, overlooking Grand Cayman's North Shore. The main building houses the reception area, dining room, bar and lounge areas. Built on three levels, the main building opens on the bottom to an expanse of wood decking, providing a second lounge area for guests. It leads to a pool and thatched hut bar. The kitchen has been completely refurbished.

The hotel was purchased by Apco Enterprises, Ltd., a subsidiary of Northwest Energy, the company currently constructing the natural gas pipeline from Alaska to the U.S.

The management has built, literally from the ground up, a complete dive shop operation. The hotel is three minutes by boat from Cayman's North Wall and several other top dive locations.

Summer rates, in effect now through December 14, are \$60 per room and each additional person is \$10. All rates are quoted in U.S. dollars, based on double occupancy EP and are subject to a surcharge of 21 percent which covers taxes and gratuities.

For information, contact Spanish Cove, P.O. Box 1014, Grand Cayman, B.W.I.; telephone 9-3765.



## Dive Grand Bahama this summer!

At package prices  
you won't believe!

Sleep next door to the famous  
Underwater Explorers Society.

At the beautiful Lucayan Bay Hotel.

In 1965, a group of visionaries set out to create the ultimate scuba diving resort on Grand Bahama Island. That dream became a reality: the Underwater Explorers Society and the Lucayan Bay Hotel. *Skin Diver Magazine* has called this complex "one of the most modern dive resorts in the world . . . 15 years ahead of its time."

At UNEXSO, dive sites are exciting, varied and nearby. 4 dive trips daily. Night dives. Inland blue hole. Reliable boats and equipment. Professional staff.

At the Lucayan Bay Hotel, everything is as casual as a soft Bahamian breeze. Every room overlooks the bay or the pool and tropical garden. Gracious service.

On fabulous Grand Bahama Island, you'll find miles of deserted sugar-white beaches, tennis, golf, horseback riding, fine dining, great nightlife, and round-the-clock casino gambling.

And you can have it all at special summer rates! Check out these super scuba packages:

### UNLIMITED DIVING PACKAGE

Dive as many as 21 times in 7 days--  
including night dives and cavern dives!

### OPEN WATER CERTIFICATION

Complete scuba course includes 5 dives  
and all equipment. Classes begin first  
Monday of each month.

Both packages include:

7 nights at the Lucayan Bay Hotel.

Free continental breakfast daily.

Free bottle of champagne.

Free giant poster- "Dive Grand Bahama."

Rates per person:

Single	Double	Triple	Quad.
\$509	\$404	\$385	\$369

Effective Apr. 26- Dec. 14, 1982. Taxes and gratuities not included.

Special low room rates available for non-divers, too.

We challenge you to compare facilities and prices! Write or call for reservations or more information. We'll send you our color brochures, plus our exclusive Dive Destination Checklist. Ask about our other package programs.

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## ANTHONY'S KEY BOAT

A new 35 foot custom fiberglass dive boat has been delivered to Anthony's Key Resort, Roatan. The vessel, built by Bill Critchfield of Sabre Marine, Inc., Orlando, Florida, is powered by a 200 hp turbo-charged diesel and is completely outfitted with modern tank racks, large



photo/Rick Frehsee

storage areas and an open transom, platform and ladder system.

All of Anthony's Key Resort boats are now fully covered, except for a forward sunning area, and feature newly designed entry and platform systems.

New owners/managers Julio Galindo

and Luey McLaughlin are also undertaking major improvements to the existing bungalows and support facilities.

For information on Anthony's Key contact: 3803 Wagonwheel Ct., Plano, Texas 75023, or P.O. Box 26556, St. Louis Park, MN 55426. ☛

## SINGING FISH

Water Planet Ocean is a presentation that features slides, light displays and tapes of singing fish. It is emceed by Gerry Hytha of the Cayman Diving Lodge.

Hytha says fish make a variety of noises which may not be "singing" in the true sense of the word, but can be music to the ears of a patient and discerning listener. To prove his point, Hytha has taped those sounds and integrated them into his slide show presentation.

For information contact Cayman Islands News Bureau, Box 330106, Coconut Grove, Miami, FL 33133. ☛

## BRITISH VIRGINS SCUBA SPHERE

Scuba Sphere, Inc. of Ft. Worth, Texas is currently running special dive packages with the Aquatic Centres in the British Virgin Islands.

Scuba Sphere is a relatively new dive store that has certification courses, equipment sales, rentals, air and dive

trips. Scuba Sphere is owned and operated by the Shumakers — Chip, Nancy, Rob and Cindy.

The Aquatic Centres were established in 1971 by George and Luana Marler.

The Aquatic Centres are at Caribbean Sailing Yachts, Treasure Isle and Prospect Reef Hotels.


For more information, contact: Chip or Rob Shumaker, Scuba Sphere, Inc., 6709 Camp Bowie, Ft. Worth, Texas 76116; (817) 731-1461 — or Aquatic Centre Stateside Office, J. W. Pepper & Son, Inc., P.O. Box 850, Valley Forge, PA 19482; (800) 345-6296. ☛

## DIVE BONAIRE SCUBA COURSES

Dive Bonaire has set its program schedule for 1982. The scuba course, held under the direction of Craig Burns, is intended for the novice or uncertified but experienced diver. The full six day program will consist of 36 hours of lecture, pool and open water training, and a minimum of five open water training dives. The course will be held August 21-28 and November 6-13.

The advanced diving course schedule is: July 3-10, August 21-28, November 13-20.

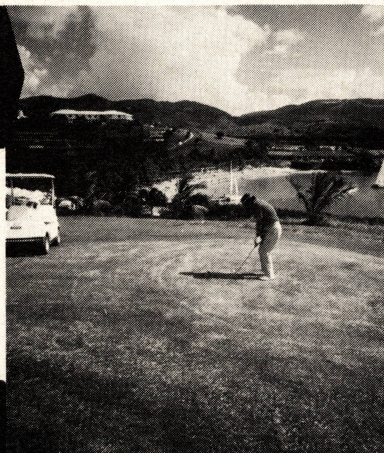
For further information, reservations, etc., contact Dive Bonaire, Flamingo Beach Hotel, 520 West State St., Ithaca, NY 14850. ☛



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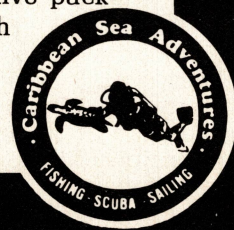
**St. Croix, U.S. Virgin Islands**



## For the discerning diver

Caribbean Sea Adventures offers Buccaneer guests the largest selection of dive sites on the island. The Buccaneer excels in watersports with CSA leaving from the Buccaneer dock every day.

For reservations and information on dive packages, contact your travel agent or Ralph Locke, 315 East 72nd St., N.Y.C. 10021  
Ph: 212-586-3070 Telex 423282  
or call Toll Free — 1-800-223-1108





## BELIZE DILEMMA

Sail Belize would like the diving public to know that Belize is far removed from the problems in Central America — not just physically, but socioeconomically as well. Belize is the only English speaking country in Central America. The government is based on the parliamentary democratic form handed down by British tradition, and has always been very stable.

Maps will clearly show that Belize is on the Caribbean, just below Cozumel and Cancun, the opposite side of the continent from El Salvador.

For information contact Sail Belize, P.O. Box 13023, St. Petersburg, FL; (800) 237-6339 or (813) 822-Sail.

## ST. THOMAS DIVING SPECIAL

The St. Thomas Diving Club at Villa Olga is presenting a Long Weekend Unlimited Diving Special, May through September. The special runs Thursday through Sunday (four days and three nights) and includes continental breakfast and three days of unlimited diving for only \$225 per person. Rates are based on double occupancy. For information, write: St. Thomas Diving Club, P.O. Box 4976, St. Thomas, VI 00801; (809) 774-1376. For reservations only — (800) 524-7940.

## PORT ROYAL/ROATAN LODGE

Underwater View Film Productions of San Antonio, TX is producing a documentary on the history of Port Royal and the Bay Islands. The film crew will be headquartered at the Roatan Lodge. Port Royal Harbour has a vast history stemming from the Paya Indians (related to the Central American Maya Indians) and Columbus' visit in 1502. Henry Morgan's home and fort was on the same site as the Roatan Lodge and later the British slave colony and fortress for maintaining supplies.

## TOUCH THE SEA

Touch The Sea, a program of personalized dive guiding, is now available to scuba divers on the island of Bonaire. The program offers beach or boat diving as well as dives at any time of the day or night — with the added feature of Dee Scarr as the guide.

Scarr, a PADI scuba and specialty instructor, is prepared to help divers increase their knowledge of the sea.

Scarr commented: "Divers with me have tickled anemones, been grabbed by crinoids and manicured by cleaner shrimp. My goal is to make each Touch The Sea dive a very special experience."

The Touch The Sea program is available through the Carib Inn and Cap'n Don's Habitat. Additional information can be received through the dive operators or by writing Scarr directly, via airmail, c/o Touch The Sea, Bonaire, NA.

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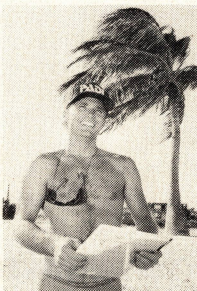
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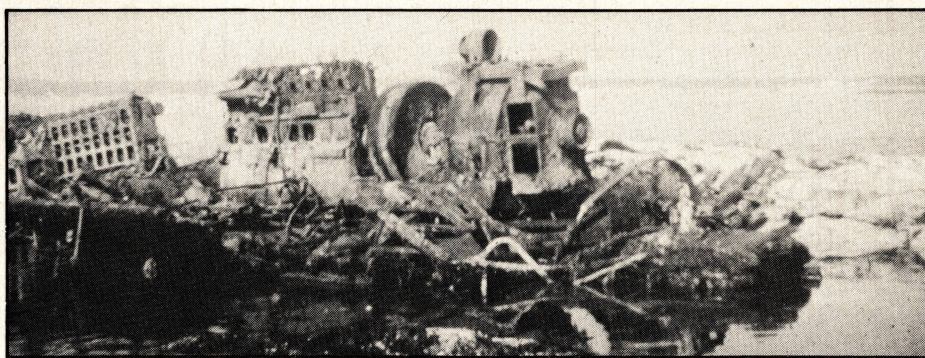
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# The Shipwrecks of Cape Ann

BY PAUL H. SHERMAN



photo/Paul Sherman

Cape Ann has long been known as one of the better dive areas in New England. Composed of the municipalities of Gloucester and Rockport, Massachusetts, Cape Ann is located just 40 miles northeast of Boston. The clarity of the water, the wide variety of marine life, and the abundance of lobsters during the summer months draw students and experienced divers, underwater photographers and, now, wreck divers.

In recent years one of Cape Ann's best kept secrets has been her great potential for shipwreck diving. Research indicates that more than 500 vessels have been wrecked along the cape's 22 mile shoreline. Thus, for its size, Cape Ann can be considered one of the most dangerous ship graveyards along the Atlantic Coast. Wrecks have occurred here since 1635 when the pin-

nace *Watch and Wait* was lost during an August hurricane near Thatcher's Island. Even in this day of modern technology wrecks continue to occur.

The wrecks seems to be concentrated in two areas of Cape Ann. Gloucester Harbor is a very important fishing port and harbor of refuge, and the harbor and its approaches have been the scene of many wrecks. During one storm in December of 1839 more than 30 vessels were destroyed in the harbor alone. To the eastward of Rockport there are a series of islands, sunken ledges and an incomplete, partially-submerged breakwater that have taken a tremendous toll on coastal shipping.

A fleet of small, fast charter boats is now serving the Cape Ann area. While many divers continue to chase lobsters, more and more are seeking the thrill of

diving on the many shipwrecks that are well known to them and the charter boat captains.

The tanker *Chester A. Poling* is Cape Ann's most popular wreck dive. She split in half and sank on January 10, 1977. The stern section has been located just outside the Dogbar Breakwater at the mouth of Gloucester Harbor. The bow section awaits discovery. The stern lies in 100 feet of water and is intact. The hull is becoming adorned with all types of marine life while large schools of fish are commonly encountered swimming across the deck. The wreck is open and can be penetrated with proper safety precautions.

Just inside the breakwater at Gloucester rests the remains of an unidentified schooner which struck while it was being constructed about 1900. The vessel is commonly called the 27 foot obstruction,

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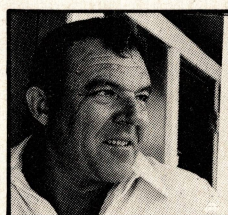
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## CAPE ANN

for that is how she is listed on navigational charts of the area. She lies on a mud bottom in 40 feet of water. Her most prominent feature is her huge windlass which rises well above the silt. Her anchors, keels and bilge lie partially exposed in the mud. Unfortunately, visibility in Gloucester Harbor is not always good. It ranges from one foot to the usual eight to ten feet.

The coastal tanker *Chelsea* sank between Straitsmouth and Thatchers islands off Rockport on February 10, 1957. She had previously grounded on nearby Avery's Ledge and tore a large hole in her bottom. Shortly after sinking the stern was dynamited because it was a menace to navigation. Today, she is a spectacular open water dive. Resting on a rocky bottom in 40 feet of water her bow is intact while her stern is scattered. Both sections are completely encrusted with a wide variety of beautiful marine invertebrates.

The largest vessel to be lost on Cape Ann is the liberty ship *Charles S. Haight* which grounded on the Flat Ground on April 2, 1946. This huge freighter, in ballast, was returning from Europe bound for Boston. Although she was stripped by wreckers and dynamited, there is still a large amount of wreckage scattered across the rocky ledge. Until the great storm of 1978 the *Haight's* huge engine block was a landmark, standing more than 20 feet off the bottom and visible in all but the highest tides. Today it lies on its side and is visible only at low water. The *Charles S. Haight* is a shallow dive in 20 to 40 feet of water, but there is a strong current flowing over the ledge during certain tides.

There are three other shipwrecks of note in the vicinity of the *Haight*. The fishing vessel *California* lies next to a pinnacle of rock between Salvages and Little Salvages ledges. She was lost on September 15, 1955 and is believed to be a former World War I submarine chaser. Her bronze rudder was recovered from a deep hole near the wreck site several years ago. Although none of the wreck's wooden hull remains, there are still many metallic souvenirs to be investigated. Water depths range from 20 to 70 feet in this very rocky area.

Just west of the Little Salvages Ledge lies the remains of the minesweeper *Grouse* which ran onto that ledge on September 21, 1963. After a week of unsuccessful salvage attempts the U.S. Navy removed the classified minesweeping equipment and burned the hull. Local salvagers picked it over until it toppled off the ledge and into shallow water.

The remains of the two masted schooner *Edward Rich* lie at the base of the incomplete Sandy Bay Breakwater in



70 feet of water. Loaded with paving blocks from nearby Pigeon Cove, the *Rich* struck the breakwater hours after setting sail on August 30, 1899. Her remains and a huge pile of paving stones lie at the base of the breakwater. Composed of huge granite blocks, the breakwater itself is a very beautiful and rewarding dive and is a favorite area for lobstering.

While many of Cape Ann's wrecks have been located, the majority have yet to be discovered. Among the most sought after are the bow of the *Chester A. Poling*, a Revenue Service cutter, and many coasting and fishing schooners, tugs and more modern wrecks.

Cape Ann is located at the northern end of Route 128. There are two boat launching ramps. In Rockport there is a public ramp at Granite Pier and one at Gloucester on the Annisquam River behind Gloucester High School. Both charge non-resident fees during the summer months. Two dive shops service the area. Both are full-service and can provide dive charters as well as air and equipment.

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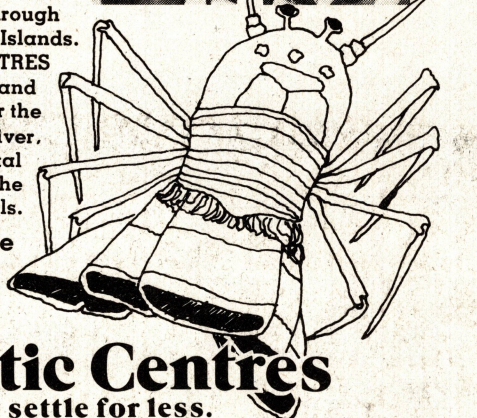
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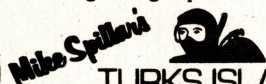
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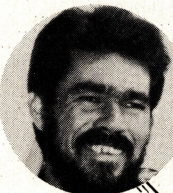
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For copies of the 1982 Scubacamp brochure and reservations, contact Mrs. Thelma Clark, Scubacamp Director, 200 Ansel Road, Geneva, Ohio 44041.

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Dive-Med International is conducting a hyperbaric chamber workshop in Freeport, Bahamas November 28 to December 4. The workshop will be held at the International Underwater Explorers Society (UNEXSO).

Simulator training aids will be used to allow participants to experience and practice intubation, CPR, intravenous therapy and bladder catheterization at pressures from 60-165 fsw. All participants will learn operation and maintenance of a hyperbaric chamber.

For further information contact: Dive-Med International, the Gruen Building, 3001 South Hanover Street, Baltimore, Maryland 21225; (301) 355-1903.

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Dive Bonaire is offering a personalized program that combines three features: the boat *Horizons*, Bonaire's reefs, and the individualized attention divemasters can give small groups.

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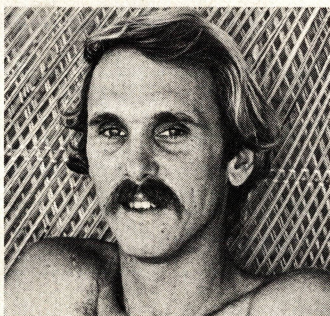


also available. These are in addition to regular dive fees. Dive Bonaire also has four flattop boats which transport up to 24 divers to sites along the island's coast.

For more information write: Dive Bonaire, Flamingo Beach Hotel, Bonaire, Netherlands Antilles (via airmail) or, 520 West State St., Ithaca, NY 14850.

## BOWKER'S BACK

Last March, Carib Inn owner, Bruce Bowker, suffered an injury to his right hand while doing some carpentry. He



was flown to Miami by ALM and, after several operations, is now back at the Carib Inn on Bonaire.

Recent improvements to the Carib Inn include a new Robalo 256 powered by twin 140 hp Johnsons. This is the Carib Inn's second dive boat and will carry from six to eight people. For more information contact the Carib Inn, P.O. Box 68, Netherlands Antilles.

## FLORIDA PACKAGE RATES

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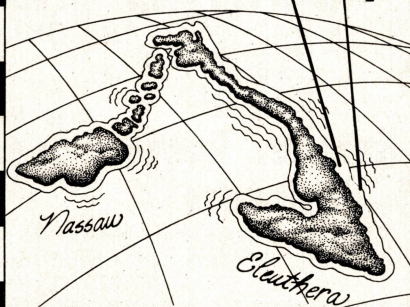
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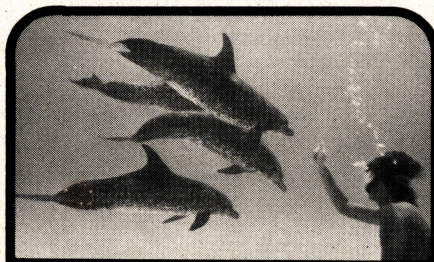


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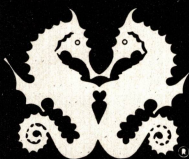
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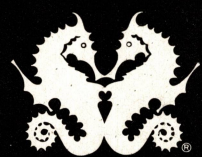
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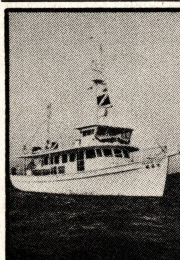
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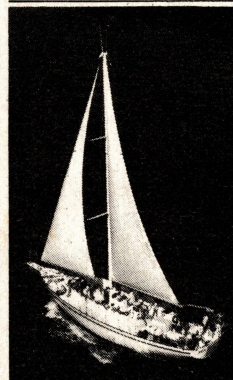
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See & Sea currently offers programs of ten dive days (30 dives) in Palau, and 11



dive days (33 dives) in Truk and Ponape. The new programs are for those divers who want a brief sample of these destinations. For example, it is now possible to combine four or six days (12 to 18 dives) in Palau with four days (12 dives) in Truk. Two days (six dives) at Ponape can be added.

These programs can be operated for three or more divers throughout the year. For further information contact: See & Sea Travel Service, 680 Beach Street, San Francisco, California, 94109; telephone (415) 771-0077.

### BAHAMAS MEDICINE COURSE

The island of San Salvador in the Bahamas has been selected for the next course on the Medicine of Sport Scuba Diving October 16- 23. The emphasis of this course will be on Hazardous Marine Life Recognition and Emergency Care.

The academic program has been approved by the AMA for 25 Category I credits, by the American College of Emergency Physicians for 25 Category I ACEP credits, by the American Academy of Family Physicians for 25 Prescribed hours, and by the Canadian Academy of Emergency Physicians for 25 credits.

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### ROYAL PALMS SOLD

The Royal Palms Hotel has been sold to the owners of the Coral Caymanian Hotel. The consolidation of the two side-by-side properties will provide the island with a resort enterprise that has 160 full service hotel rooms.

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## SPEARFISHING

(Continued from Page 83)

species they wish to eat and the larger individuals. There are a few exceptions; there are a few divers who shoot fish commercially. But the majority are simply out to get enough fish to take home for supper.

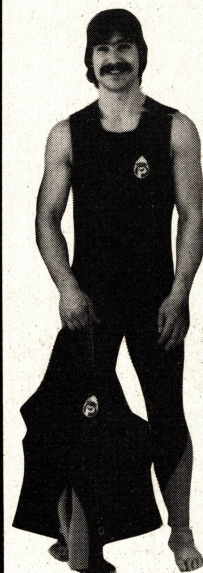
I must admit I become a bit hostile when anglers speak of the, "cowardly spearfishermen killing those defenseless fish." The line angler is sitting up in the comfort of his favorite fighting chair with his only danger being sunburn or cutting his thumb on the pop-top on his beer can, while I am down stalking the fish in its own environment. To add to that, the fish has better vision, superior hearing, greater mobility, and in some species, the very real ability to eat me instead of my eating him.

In Florida, the legislature has passed a law outlawing the use of poppers for taking food fish, mainly jewfish and amberjack. A popper is a device on a spear-gun tip that emits a toxic gas that kills the fish after it is speared. This law had absolutely no scientific justification. If a species is in danger, it should either be protected completely or bag limits placed on its capture. But to prohibit its being taken by poppers and then allowing it to be taken with hook and line is to discriminate against one type of fisherman.

It would seem about time we begin to manage our underwater resources in the same way we do those above the high tide line. Some of our forest areas are designated as wildlife preserves. In these areas, no game may be taken by any means — traps, guns, bows or whatever. We should have some areas in the sea — underwater parks — where no species of marine life can be disturbed in any way. (Florida has a coral reef state park, but line fishing is allowed.) On land, there are some forest areas that are designated wildlife management areas. In a wildlife management area, certain species may be taken, but the removal is carefully supervised with bag limits and closed seasons. The same principles could be applied to a coastal area. Regular surveys could be conducted to determine the population levels of food and game species and adjustments made in the season or bag limits as needed to maintain a viable population. Areas that are not overfished could be left unregulated, as is the situation for most underwater environments at present. This would then provide something for everybody without the present practice of restricting the spearfishermen because they don't have the political clout of the line fishermen. From a fishery management standpoint, a fish taken by hook and line is just as dead as one taken from a speargun. Let's manage our underwater resources based on scientific facts, not emotion or politics. 

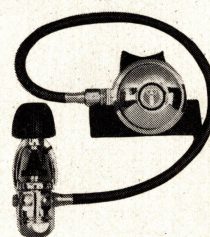
# New England Divers July Super Savers

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Conshelf Regulator**  
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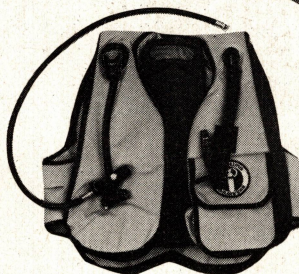
**Ocean Dynamics  
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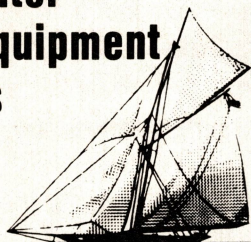


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## Underwater photo equipment specials



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sale ends Aug. 31, 1982

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in Ikelite housing. 399.95  
Canon lenses  
55mm Macro.... 163.95  
28mm 2.8..... 119.95  
35mm 2.8..... 89.95  
Canon 310XL movie camera  
w/ Ikelite housing. 279.95

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Sync. w/ NIK. conn.....\$230.00  
Sync. w/ Sea-Loc..... 189.95  
Slave no cord..... 189.95  
Subsea MK150..... 439.95  
Ikelite Substrobe 150..... 389.95  
Vivitar 283 w/ Ikelite housing-power  
pack & short tray..... 179.95

#### Accessories

Oceanic Meter..... 79.95  
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SAVE \$

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## PDSNY TOUR

Eight members of the Scuba Sport Rites Club of Westchester toured the City Island facilities of International Underwater Contractors. Led by Leroy Bonaparte, the group received IUC's commercial orientation briefing from Gary Parsons, training director of the Professional Diving School of New York. The tour included close-up looks at 600 and 1000 foot saturation systems and several exotic submersibles, including the *Mark IV Beaver*, capable of carrying five men to a depth of 2000 feet. PDSNY's Parsons says that the company welcomes such tours at its 7.5 acre facility, providing arrangements are made several weeks in advance. ➤

## BROCK TO WATERLUNG

Mike Brock has joined Waterlung/Sportsways as a consultant. Brock is an instructor and has been active with a major manufacturer of scuba gear for 13 years.

Brock will use his equipment expertise and dive experience to assist the Waterlung sales manager and sales force in present product and new product promotions. ➤

## YMCA SUMMER SESSION

A summer session is planned for the Underwater Staff College at the National YMCA Center for Underwater Activities in Key West, Florida in August. The session provides an opportunity to proceed directly through the YMCA's continuing education program to the desired level of leadership without interruption. The necessary practical experience in diving, diving supervision and instruction are provided in a curriculum which also includes the appropriate academic training and student/candidate evaluation.

Student/candidates may participate in any or all of the programs. The cost, course dates and other information can be obtained by contacting Staff College at the National YMCA Center for Underwater Activities, P.O. Box 1547, Key West, FL 33040; (305) 294-5288. ➤

## SEAQUEST/SUUNTO OY

SeaQuest, Inc., a manufacturer of buoyancy compensators, has announced its acquisition by Suunto Oy.

A California based company, SeaQuest distributes AMF Mares products in the U.S. and Canada. Suunto is a Finnish company specializing in marine, land and underwater compasses.

Charles J. Jehle, president of SeaQuest, is currently working on plans to expand the present facility by 10,000 square feet. As a result, research and development efforts will be expanded and production increased. ➤

## Tom Mount's U/W Photography College

modeling by Patti Schaeffer

### 1982 SCHEDULE

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October 3-9

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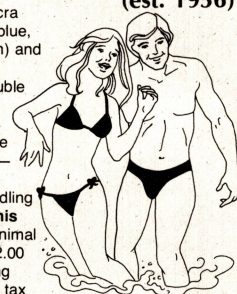
## Mike Kevorkian's SWIMWEAR SPECIALISTS (est. 1956)

#### Men's Bikinis

- Fast drying nylon lycra
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- 1" and 2" sides, double front in S, M, L, XL (\$9.95 — 3 for \$25)
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#### Women's String Bikinis

- Beautifully styled minimal brief. \$16.95 plus \$2.00 postage and handling
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## FACE PLATE MAGNIFYING GLASS KIT

LIBRA OPTICS faceplate magnifying glass do-it-yourself kit is for use to detect and examine small shells or marine articles and essential for far-sighted divers to safely read tank pressure and depth gauges during deep-dives. The magnifying glass installed on your faceplate acts in much the same way as bifocal reading glasses and focuses at approximately 16 inches in water.

The kit contains magnifying glass, cement and adequate instructions for the layman.

Send \$15.95 plus \$1.00 for handling to LIBRA OPTICS, P.O. BOX 6342, HUNTINGTON BEACH, CA 92648. In Calif. add \$.96 for sales tax.

## YES I WANT THE WHOLE STORY ABOUT COMMERCIAL DIVING Commercial Diving Institute

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## **DIVE RIGHT**

—by R. Drew

An interview with Steven A. Samelak, Vice President of the UNITED STATES SCUBA COUNCIL.

DR: Steve, what exactly is the U.S.S.C.?

SS: The U.S.S.C. is an organization of Certified divers and chapter dive clubs.

DR: What do you offer to your members and chapter clubs?

SS: Well, we offer discounts on various dive trips both in and out of the U.S.A., free clinics and seminars on several diving topics, events centered around diving such as underwater contests. We also promote the need for certification and diver safety.

DR: What type of underwater contests do you hold?

SS: Underwater Easter egg hunts, skills contests, checkers contests, just about anything that gives our members time "down under."

DR: What is going to be your next event?

SS: Our next big event is going to be an underwater scavenger hunt September 19, 1982.

DR: What exactly is an underwater scavenger hunt, and what will it have to offer?

SS: We are going to place all kinds of objects in Pearl Lake which is in South Beloit Illinois (just North of Rockford). The objects will be all kinds of odds and ends, some big enough for a lift bag and some small enough for a goodie bag. Each object will have a point value assigned to it. The object of the event is to find as many items as possible thereby getting as many points as possible. We are going to have over \$5,000.00 worth of prizes to award. The diver with the most points will choose the prize he or she wants. The second place diver chooses next, and so on down the line. This way a diver is not "stuck" with a tank when he wanted the camera!

DR: How long is this event going to last?

SS: We are going to start diving September 19, 1982 at 9:30 am, break for picnic lunch and barbaque at 11:30, and start diving again at 1:00 pm. The second half should be over at 3:00 pm, and prizes chosen at 4:00 pm. So as you can see it's going to last all day.

DR: You mentioned \$5,000.00 in prizes. What are some of the prizes that you will have?

SS: We'll have tanks, regulators, masks, fins, snorkels, spear guns and various other pieces of diving gear. We also realize that many divers have all the gear they need or want, so we will also have prizes like radios, stereos, watches, calculators, cameras, headphones and various pieces of sports equipment.

DR: What will this event cost, and will be included?

SS: If the persons register before August 15, the cost is \$15.00 for a non-member diver, \$10.00 for a member diver. Non divers cost is \$10.00. If registration is after August 15, the cost is \$20.00 for non-member diver and \$15.00 for a member diver. Non divers cost is \$15.00, so it pays to register early. If a diver sends in a membership application with the \$20.00 dues, along with this ticket request, he or she will pay the member cost! Included will be the diving, divers prizes, unlimited food and drinks, and a great time!

DR: Where can someone write for the membership application and further details on your organization?

SS: They can write to me at: U.S.S.C. P.O. Box 331, Downers Grove Illinois. The zip is 60515.

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# **PADI**

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### **INTERNATIONAL PADI INSTRUCTORS TRAINING CENTER**

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##### **JUNE:**

Instructor Training Course (I.T.C.)	4-13
Master Scuba Diver Course	5, 6, 12, 13, 19, 20, 26, 27 July 10, 11

Research Diver	5, 6
Search & Recovery	12, 13
Under Water Hunter	19, 20
Instructor Orientation Course (I.O.C.)	26, 27
Wreck Diver	26, 27
Night Diver	29, 30

##### **JULY:**

Deep Diver (Munising, WI)	2, 3, 4
Wreck Diver (Munising, WI)	2, 3, 4
Instructor Training Course (I.T.C.)	9, 10, 11, 17, 18, 24, 25, 31, 1

Equipment Specialist	10, 11, 12
Deep Diver	17, 18
Wreck Diver	17, 18
Night Diver	20, 21
Research Diver	24, 25
Divemaster	24, 25, 25, 27, 28
Underwater Photographer	10, 11

##### **AUGUST:**

Underwater Hunter & Collector	7, 8
Buddy Diver	7, 8
Master Scuba Diver (Sweden)	9-17
Wreck Diver	14, 15
Night Diver	17, 18
Instructor Training Course	20-29
Rescue Diver	21, 22
Deep Diver	25, 26
Rescue Diver	25, 26

##### **SEPTEMBER:**

Search & Recovery	4, 5
Pre-I.T.C.	4, 5
Night Diver	7, 8
Underwater Hunter	7, 8
Wreck Diver	7, 8
Boat Diver	7, 8
Instructor Training Course	8-16
Underwater Photographer (Florida, Georgia)	18-19

##### **OCTOBER:**

Rescue Diver	13, 14
Seminar	20
Equipment Specialist	23-25
Cavern Diver (Florida)	23, 24
Instructor Training Course (Georgia)	23-31

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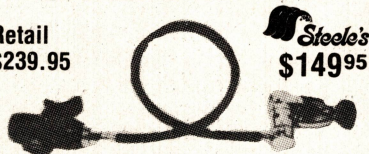


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150' or 150' Oil-Filled Depth Gauge, 4000 PSI Pressure Gauge, Both With Luminous Face.

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## U/W INVITATION

A weekend conference entitled *Underwater Invitation* will be held on September 18-19 in Vancouver, B.C. Presentations will focus on activities of interest to divers and non-divers alike. The Saturday program includes an underwater Treasure Hunt for both skin and scuba diving enthusiasts; an underwater photo competition; and, a no-host Western Evening wine and cheese party.

On September 19, Stan Waterman will present some of his finest films at the Queen Elizabeth Theatre.

Tickets will be available at concert box offices in Vancouver and Seattle, and also at local dive shops.

## GOLD GUN

JBL Enterprises Inc., presents its gold speargun to dealers who place a nominal order with the company. This gun is a 4D44 model with a black anodized bar-



rel and extension as well as a gold plated muzzle and handle.

For information contact JBL Enterprises, Inc., 426 W. Almond Ave., Orange, CA 92666.

## SEA HORSES ANNIVERSARY

The Philadelphia Sea Horses Dive Club will celebrate its 25th Anniversary with a Silver Anniversary Dinner/Dance on September 26 at Penn's Landing in Philadelphia. Old and new members are invited, but an invitation will be required.

As the club is updating its mailing list, old members are asked to send in their current address with their request for an invitation.

For information and/or an invitation contact John Juzbasich, 434 Pine Lane, King of Prussia, PA 19406.

## CLARK AWARD

At the recent Boston Sea Rovers symposium and film festival, Dr. Eugenie Clark was presented with the John Stoneman Marine Environmental Award for her dedication to the marine sciences. This award is presented annually to an individual who has made a major contribution to our better understanding of the marine environment.

## PLYTYSKI/OCEANQUEST

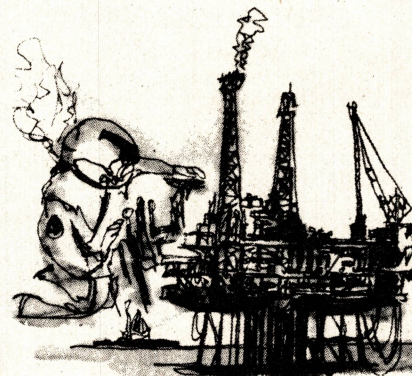
Judy Plytynski will direct and coordinate OceanQuest's international airline reservations system. Formerly a sales executive with Laker Airways, Ltd., Ply-

## DOCTORFISH PRACTICE WITH US.



At Human Underwater Biology, we school physicians in diving medicine. Our graduates—called "Doctorfish"—have completed the field's most highly accredited and superbly organized CME programs. And they've done it in the world's select dive spots.

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## MAR-VEL is underwater EVERYWHERE

The Mar-Vel Diving Specialties catalog offers the most complete source of diving equipment unequaled elsewhere, featuring a complete listing of diving gear designed for the commercial operator, skin and scuba diver, marine scientist, photographer, military and salvage diver.

Catalog \$2 Refundable with first order.

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tynski will be responsible for the programming, development and administration of OceanQuest's Apollo computer reservations system under the title of airline reservations/sales director.

OceanQuest's corporate and affiliate offices are on-line with United Airlines



Apollo reservations and ticketing system. Under the direction of Plytynski, all reservations desks are an extension of over 500 airlines, both domestic and international, and enable dive travelers to obtain flight information, itineraries and availabilities for more than 100,000 city pairs worldwide.

Professional travel agencies, tour operators, dive stores, clubs and groups can use OceanQuest reservations for dive travel bookings. Some of OceanQuest's 1982 itinerary includes: Australia, Bonaire, British Virgin Islands, Cayman Islands, Cozumel, Cuba, Roatan, St. Lucia, Tahiti and the Turks and Caicos Islands. For information and reservations call nationwide (800) 526-1394 or (201) 744-5254.

## U/W SOCIETY COMPETITIONS

The Southwest Council of Diving Clubs will host the 1982 Underwater Society of America International Scuba Championships July 10-11. Redwood Lodge, Lake Whitney, Texas, will be contest headquarters.

Divers will be representing all regions of the continental U.S., Hawaii and the Virgin Islands. Only those divers who ranked highest, as far as point standings within their respective councils, are eligible to compete in the championships.

Competitions include spearfishing, buddy breathing, U/W navigation and tank exchange. All competitions will be held on Saturday except spearfishing which will be Sunday morning.

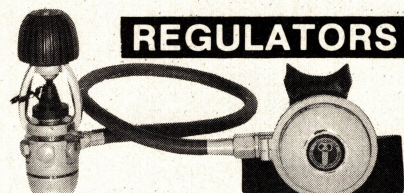
For more information contact Johnny Campbell (817) 776-5186 or Bill Riggie at (817) 282-5785.

## LAPORTE'S CORRECTION

In April, SDM published the wrong phone number for LaPorte's Skindiving Shop. The correct number is (603) 763-5353. LaPorte's can also be contacted at Box 53, Newbury, NH 03255.

# PRICE BUSTERS

**SPORTS Merchandisers** is a **Price Buster!** Our warehouse stocks thousands of items for immediate shipment anywhere in the U.S. We sell only brand name merchandise in original boxes with guarantees from U.S. manufacturers, and will try to beat every price.



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**U.S. DIVERS' Calypso VI**

**119<sup>95</sup>**

**DACOR PACER Model 900**

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**Octopus**

**59<sup>95</sup>**

**TEKNA 2100 B**

**149<sup>95</sup>**

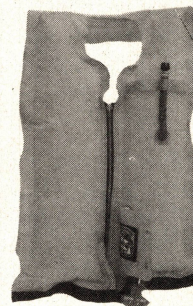
**POSEIDON Cyklon 300**

**144<sup>95</sup>**

**AMF MR12II**

**129<sup>95</sup>**

Add \$3.00 shipping for each Regulator



## EXTRA SPECIAL

## SKIN DIVER VEST

Low profile — complete with oral inflator and CO<sub>2</sub> cartridge. Universal Adult Size Gold with Black Trim  
**REG. \$49.95**

**OUR PRICE 19<sup>95</sup>**

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**U.S. DIVERS' SEA OTTER**

Complete with power inflator

**149<sup>95</sup>**

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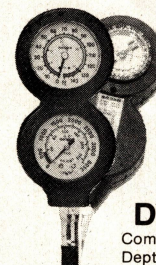
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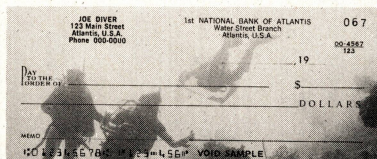
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## VON HURST TO PADI

PADI Headquarters has appointed Eric Von Hurst to the PADI International Advisory Board. A full-time resident of Japan, Eric will also serve as the PADI



headquarters advisor to PADI Japan under the direction of international operations manager John Stewart. His duties will include training, teaching instructor development seminars, and serving as chairman of the ethics committee.

Eric, with the aid of his wife Chikako, is now working to translate more of PADI's instructor support materials into Japanese. For more information on PADI programs in Japan, contact PADI, International Operations Dept., 1243 E. Warner Ave., Santa Ana, CA 92705.

## SWAP MEET

The Santa Ana College Dive Club is sponsoring its Third Annual Divers Swap Meet. This event will be held at Santa Ana College, 17th St. and Bristol St. in Santa Ana, CA from 10 am to 4 pm on September 19.

Last year six dive shops and many individuals participated and the event drew over 200 people. This year the time has been lengthened so more people and shops can participate.

The swap meet is being held on the pool deck at Santa Ana College and the pool will be open so equipment can be tried. For information contact: Jim Taylor, 22011-J Rimhurst Dr., El Toro, CA.

## PURE AIR BROCHURE

A full color brochure is now available from Bristol Pneumatic which describes its range of high pressure air purification systems. Fitted to all Bristol breathing air charging sets, these pure air systems can also be used in many other high pressure compressor installations. The brochure includes cut-away drawings that highlight the technical features and a listing of the six different filter combinations available.

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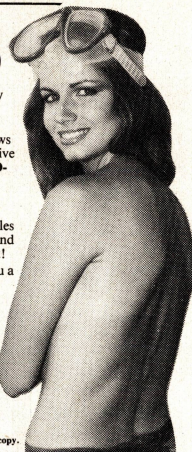
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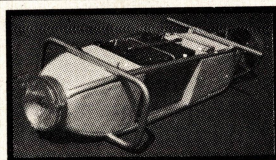
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According to Dr. Sam Gruber, University of Miami researcher, the secretion — and its chemical equivalent — affects the shark's sensory system, interfering with the shark's breathing and possibly causing death.

## DIVING FOR DOLLARS

Since 1979 divers from San Diego, California have been establishing world records for underwater games to benefit various charities. Underwater events held have included; backgammon (336



photo/Al Bruton

hrs., 2 min., 30 sec.), Parcheesi (130 hrs., 3 min., 45 sec.), Yahtzee (30 hrs.), Las Vegas style blackjack (12 hrs.), and Easter egg hunts.

To date, over \$13,000 has been raised to benefit charities such as: the Muscular Dystrophy Association, the March of Dimes, and Leukemia Foundation. Local businesses and national dive equipment manufacturers have all participated by donating prizes.

## UNDERWATER TRIKING RECORD

Thirty-two divers recently participated in the longest continuous underwater trike cycle race (and maybe the first) ever recorded. The participants combined their efforts to keep someone continually triking for 60 hours and 65 miles.

The event was sponsored by the University of Arizona chapter of Sigma Chi fraternity, and the Silent Experience Scuba Shop of Tucson, Arizona. The marathon was held in the Amphitheater High School pool in Tucson.

Over \$3,000 was raised (through per-mile pledges) during the event. The money will be donated to Casa de los Ninos Crisis Nursery in Tucson.

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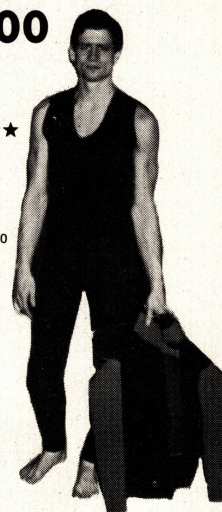
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# Divers Directory



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dorms, RV hook-ups. Cavern and system dive. Gulf and Keys trips.

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BUDDY'S DIVE SHOP 305/664-4707  
P.O. Box 409, Islamorada, FL 33036 MM. 79.5 @ Bud 'n Mary's Marina.  
Daily trips to Alligator Reef and Coral Gardens. Group instr.,  
diving and room pkg. prices. Next door at Holiday Inn, Islamorada.  
CAPT. SLATE'S ATLANTIS DIVE CENTER 305/451-3020  
51 Garden Cove Dr., Key Largo, FL 33037 MM. 106.5  
Dive Pennekamp aboard 40' custom dive boat. NAUI, YMCA, PADI,  
CMAS instr. Dock side air & mtls., grp. & multi-dive discounts.  
CUDA V DIVE SHOP. CAPT. AL AND JERI PRICE  
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Located at Sunshine Key RV park. Fishing, reef diving,  
back country, complete dive shop, sales and rentals.  
DIVERS' WORLD OF KEY LARGO, INC. 305/852-5498  
P.O. Box 1663, Key Largo, FL 33037 MM. 97.5  
On the Atlantic at Rock Harbor Marina.  
Reef trips, air, instruction, sales, rentals.  
DIVING SITE & CORAL LAGOON RESORT 305/289-1021  
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Pro dive shop, PADI training facility, dive packages.  
40' and 34' dive boats, effc. apts., pool, daily reef trips.  
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20' Robalo dive boat. Luxuriously furnished 46', a/c, color tv.  
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HALL'S DIVING CENTER & RESORT 305/743-5929  
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Pennekamp our specialty, best service, dive and motel  
rates in Keys, Dacor, Scubapro. Our 20th anniversary.

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KEY LARGO 305/255-4556  
P.O. Box 161414, Miami, FL 33116  
2 bedroom, 2 bath waterfront, sleeps 6. \$350 per week.  
Dive from our dock or minutes to dive shops and Pennekamp.

KEY WEST PRO DIVE SHOP, INC. 305/296-3823  
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Quality reef trips, underwater photography equipment  
available. Full service dive shop.

OCEAN DIVERS INC. 305/451-1113  
Box 1113-A, Key Largo, FL 33037  
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Bahamas and Cay Sal Islands.

PENNEKAMP DIVING HEADQUARTERS 305/451-1151  
105920 Overseas Hwy., Key Largo, FL 33037  
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PENNEKAMP STATE PARK CONCESSION 305/451-1621  
P.O. Box 13-M, Key Largo, FL 33037 800/432-2871  
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25c for reef map.

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comfortable accommodations and comfortable prices.

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Dive Looe Key.

UNDERSEAS, INC. 305/872-2700  
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Not Kona's biggest, Kona's best! Write.

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Send for free Maui Diver's Guide, enclose \$1 postage.  
Dive charters to Molokini, rentals, 5 day scuba classes.

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May we share aloha by gently introducing you to the  
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AQUAVENTURE—1655 Oakton, Des Plaines, IL 60018 312/297-7414  
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Aqua Craft, Wenoka. Air, rentals, accessories.

REEF AND WRECK DIVERS 312/751-2424  
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repairs, dive trips.

SCUBAMART 312/965-5522  
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MAR'S MARINE AND DIVE SHOP, INC. 319/324-8771  
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Fully equipped fish or dive.

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USCG licensed, dive boat East Diver, Cape Ann Marina.

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**EAST COAST DIVING CHARTERS, INC.**  
Diving charters from Cape Cod to Cape Ann, MA  
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For Boston and Cape Ann call 617/277-2216

**EASTERN DIVERS SUPPLY, INC.** 617/453-7574  
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**INLAND DIVERS** 617/892-3323  
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**MARINE SPECIALTIES, INC.** 617/487-1764  
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**SHIP MATE DIVE SHOP** 617/385-8782  
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Wreck diving specialists.

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**SEAQUATICS, INC.** 517/835-6391  
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**LAPORTE'S SKINDIVING SHOP** 603/763-5353  
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**UNDERWATER SPORTS OF NH** 603/357-4430  
334 Park Ave., Keene, N.H. 03431  
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## NEW JERSEY

**CEDAR GROVE DIVERS SUPPLY** 201/857-1748  
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746 West Ave., Ocean City, NJ 08226 609/398-6551

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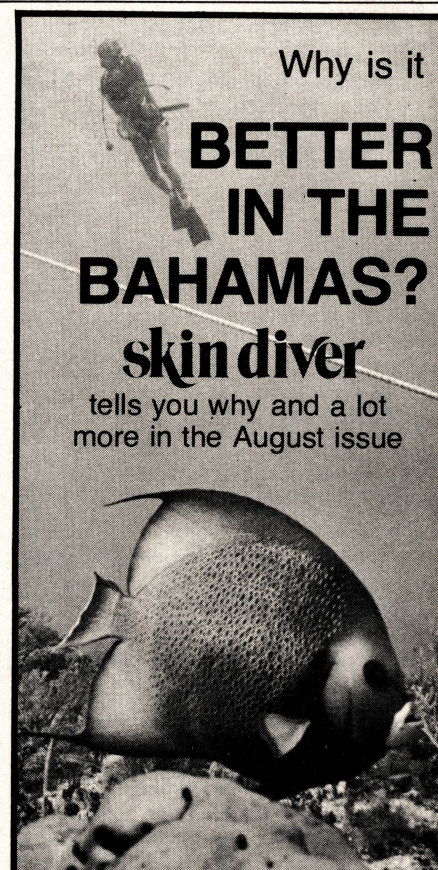
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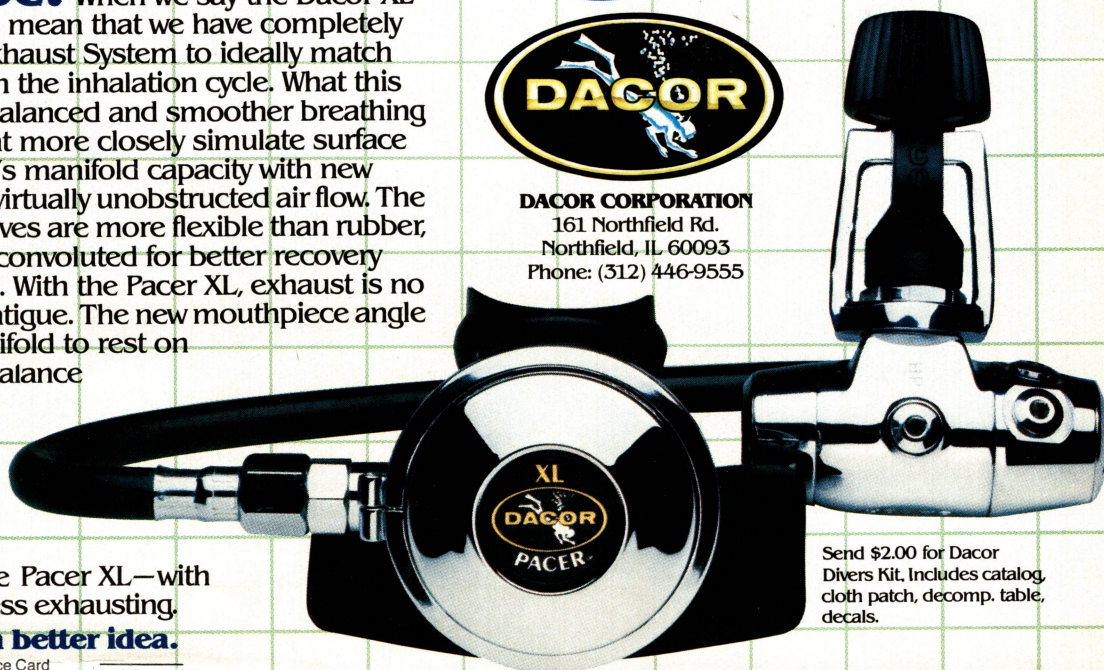
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